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Rabid Dogs Lose Bout with Police

LEMARS, Ia.—Special: A fierce 10-minute battle between two rabid dogs and two police officers ended safely for the policemen here Monday when they poured a volley of shots into the raging animals.

Two stray shorthaired mongrels, one white and one brown, came running up the road from the south and charged a group of small children playing in the [redacted] home yard in the southeast part of town near Cleveland park.

The frightened, screaming children ran into the Lewis home with the rabid dogs at their heels.

After racing through the upstairs rooms, snarling, barking and foaming at the mouth, the dogs finally dashed into the basement of the house. Meanwhile, Mrs. [redacted] herded the crying children into a bedroom and ran to a neighbor's house to telephone police. She had no phone in her home. [redacted] and [redacted] answered the call. When they opened the basement door slightly, the large brown dog hurtled through the doorway, jumping on top of [redacted]. [redacted] fought off the furious attack, kicking and defending himself as best he could, but could not use his gun.

As the enraged animal pounced upon [redacted] he poured a volley of shots into the dog. The wily mongrel put up no fight but lay on the floor moaning and shrieking and foaming at the mouth. He then shot the other dog. Neither of the men was bitten by the dogs.

Dr. [redacted], [redacted] veterinarian, examined the dogs and declared them rabid. The bodies were burned. Dr. [redacted] warned farmers and others to be on the lookout for rabid animals as the dogs may [redacted] animals before enter-

ON THE
Iowan
Boost
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at Ok

Journal of the American Veterinary Medical Association

CONTENTS

Continued from Cover

CLINICAL DATA

Immunity Studies in Dourine 466
Leptospirosis in Bitches 468
Leptospirosis in Dogs 468
Esophageal Sarcomas and Spirocerca Lupi Infections in Dogs 468
Canine Whipworms 470
Candida Albicans on Grass 470
Experimental Evaluation of a Dual (Distemper-Hepatitis) Vaccine in the Field .. 471
Blood Disorders in Cats 472
Disease Conditions Prominent in Cats 472
Comparing Two Antimycotics 472
Canine Strongyloides Infection 475
Skin Disorders of Small Animals 475
Scrapie in Australia in 1952 476
Ovine Brucellosis in Australia 476
Erysipelas in Nutria 476

NUTRITION

Observations on Eating in Cattle 477
Prevention of "Yellow Fat" in Mink 477
Protein in Chronic Renal Disease 477
Fat in the Diet of Growing Chicks 477
Vitamins in Poultry Disease 477

CURRENT LITERATURE

Abstracts

Immunogenicity of Rabbit-Adapted Foot-and-Mouth Disease Virus 479
Bluetongue Virus in Tissue Culture 479
Drugs Affecting Myoclonia Congenita in Pigs 479
New Anthelmintic for Cattle 479
An Erysipelas Culture Agglutination Test .. 479
Blood Serum Vitamin B_{12} Levels in Swine .. 479

Foreign Abstracts

Salt Poisoning and Pasteurellosis of Swine . 480
Tuberculin Reactions in Dogs 480

Books and Reports

Eleven Blue Men 480
Symposium on Latency and Masking in Viral and Rickettsial Infections 480
The Theory and Practice of Nutria Ranching 481
Genetic Resistance to Disease in Domestic Animals 481
Practical Use of the Microscope Including Photomicrography 481
Reproduction and Artificial Insemination of Domestic Animals 482
Veterinary Obstetrics 482
Basic Care of Experimental Animals 482

THE NEWS

Dr. Mingle Reports on Veterinary Education in Italy 483
Lebanese Visitor 483
Colonel Rust Joins University of Chicago .. 484
Among the States and Provinces 484
Foreign News 488
State Board Examinations 489
Deaths 489

MISCELLANEOUS

Clinical Care and Prognosis in Canine Respiratory Coccidioidomycosis 433
Veterinary Medicine in the U.S.S.R. 436
Animal Colostrum for Human Babies 436
New Vaccine for Teschen Disease 442
Swine Erysipelas in Australia 442
Livestock Changes for 1959 449
Chlorpromazine for Tetanus 449
Report on Zoonoses 451
Round Heart Disease in Chickens 453
Parthenogenetic Turkey Sires Young 453
Source of Histoplasmosis 453
A Healthy Baby from a Rabies-Infected Mother ..... adv. p. 42

ORGANIZATION SECTION

Vacation Opportunities in Missouri, adv. p. 26
Student Chapter Activities ..... adv. p. 28
Women's Auxiliary—New Constitution for the House of Representatives ..... adv. p. 28

EDITORIAL STAFF: W. A. Aitken, Editor in Chief; Donald A. Price, *Associate Editor;* H. E. Kingman, Jr., *Managing Editor;* Eva G. Bailey, *Assistant to the Editors.*

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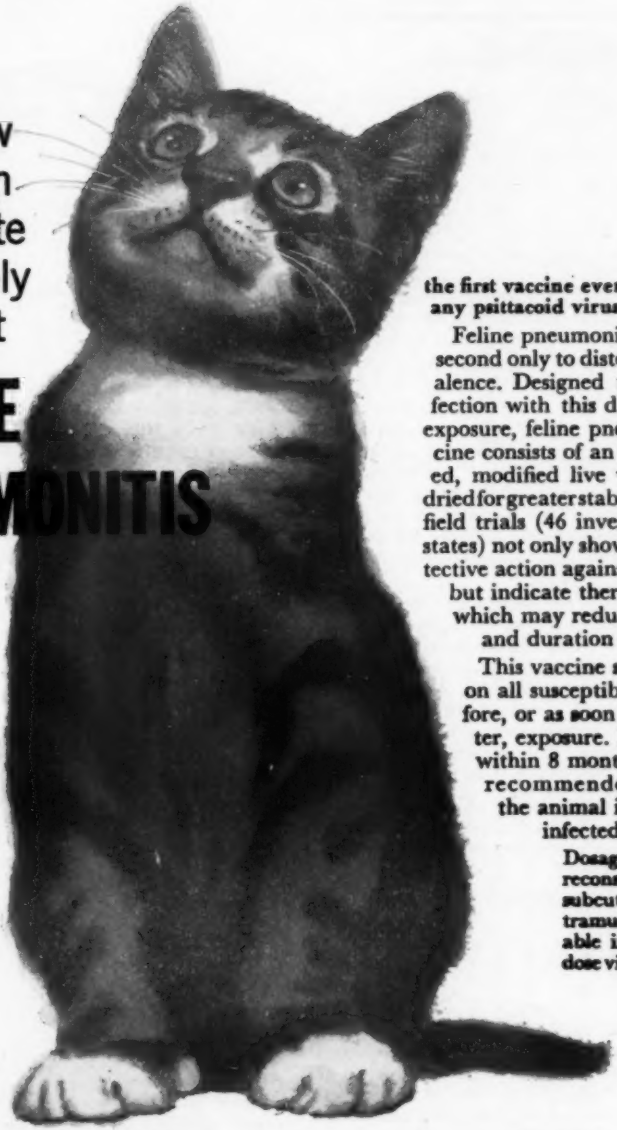

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This vaccine should be used on all susceptible animals before, or as soon as possible after, exposure. Revaccination within 8 months to a year is recommended whenever the animal is placed in an infected environment.

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extensive field trials show 80% of cats protected by vaccine				therapeutic effects also indicated			
No. of cats	Status	No. of cats remaining well	No. of cats developing symptoms	No. of cats	Status	No. of cats recovering in 5 days	No. of cats remaining sick after 5 days
1482	vaccinated	1254 (86%)	208 (14%)	611	treated	449 (74%)	162 (26%)
809	controls	483 (60%)	326 (40%)	379	controls	66 (17%)	313 (83%)
field use in noninfected cats				field use in infected cats			

PITMAN-MOORE COMPANY Division, **ALLIED LABORATORIES, INC.**, Indianapolis, Indiana

Correspondence

April 21, 1959

Dear Sir:

The authors of the article "Management of Bovine Genital Infections I. Intravaginal Therapy" (JOURNAL, April 1, 1959), have wisely called attention to the fact that genital infections are frequently responsible for impaired fertility; they report that the use of an antimicrobial vaginal insert was effective in improving breeding efficiency. The report appears to be quite logical and promising.

Under "Materials and Methods" (item 3), and again under "Results and Discussion" (table 2), however, there is reference to the selection of the "drug of choice" based, at least in part, on the size of a zone of inhibition observed on an antimicrobial disc sensitivity plate. I believe that this interpretation is somewhat misleading and even contrary to the instructions supplied by the manufacturer of the product used to make the determination (Sensi-Discs, Baltimore Biological Lab., Inc.).

The manufacturer has recognized that the *size* of a zone of inhibition may be dependent upon several factors other than the antimicrobial activity of an agent. They have, therefore, made a special point to emphasize that the disc technique is a *qualitative* procedure, designed primarily to determine whether an organism is *sensitive* or *resistant*. In describing the interpretation of results, the manufacturer specifically states:

". . . an organism found to be sensitive to several antimicrobial agents may not necessarily be most sensitive to the one producing the largest zone of inhibition."

s/SIMON J. KALISH, D.V.M.
Brooklyn, N. Y.

✦ ✦ ✦

April 24, 1959

Dear Doctor:

The authors appreciate Dr. Kalish's comments. We are cognizant that all things in the biological sciences are qualitative. To the best of our knowledge in selecting size of the inhibition area as an index of "drug of choice," we were following a precedent and accepted criterion in common use by medical investigators throughout the world.

Limitations of *in vitro* bacteriological sensitivity tests are recognized. However, if there is a better method of determining drug efficiency, we would like to hear of it.

s/R. F. VIGUE, D.V.M.
W. H. FITZGERALD, B. S.
R. F. CASTRUCCI, B. S.
Springvale, Maine.

March 8, 1959

Sir:

In regard to a letter from Dr. D. L. Paice, published in the February 15 JOURNAL, I have often wished that flying veterinarians were organized, but perhaps less formally than those in the A.M.A. group. Three of us in this community are pilots.

Yours truly,
s/M. M. STILES, D.V.M.
Battle Creek, Mich.

✦ ✦ ✦

April 4, 1959

Sir:

Was much amused by your April 1 editorial, "Let's Write More Clearly." I applied the Fog Index to the first paragraph of an article in that issue and arrived at the rather high figure of 22.8. Wanting to be fair, I then tried the next two paragraphs but they were 28.5.

The editorial clearly states it is the duty of the editor as the representative of the reader to prevent this. How do you plead?

s/ALFRED J. LIEPOLD, D.V.M.
Selma, Ala.

[Unfortunately, some of our published papers do have a Fog Index that is too high. But the editorial did not say that it is the duty of the editor to *prevent* it. In our editing, we often either call the author's attention to foggy writing or suggest how to state facts more simply. However, many authors object to extensive editing; therefore, we must accept material somewhat in their words and style, even though foggy.]—ED.

✦ ✦ ✦

April 15, 1959

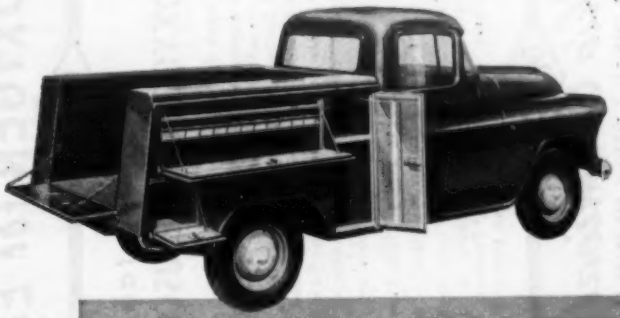
Gentlemen:

I am a Spanish veterinarian, 31 years old, with three years of field experience. I imagine my English to be fluent and I am fairly familiar with English and American professional literature.

I wonder if there is any chance of assisting, for a period of at least six months, an American colleague who would provide me with board and lodgement (otherwise I would not be able to afford the expenses). I will be very grateful for assistance in securing such a position.

Yours very truly,
s/JULIO MARCOS, D.V.M.
Mola 11
Leon, Spain

P. S. On request I will send a sponsoring letter from Dr. S. Ovejero del Agua, Dean of the Leon Veterinary College.



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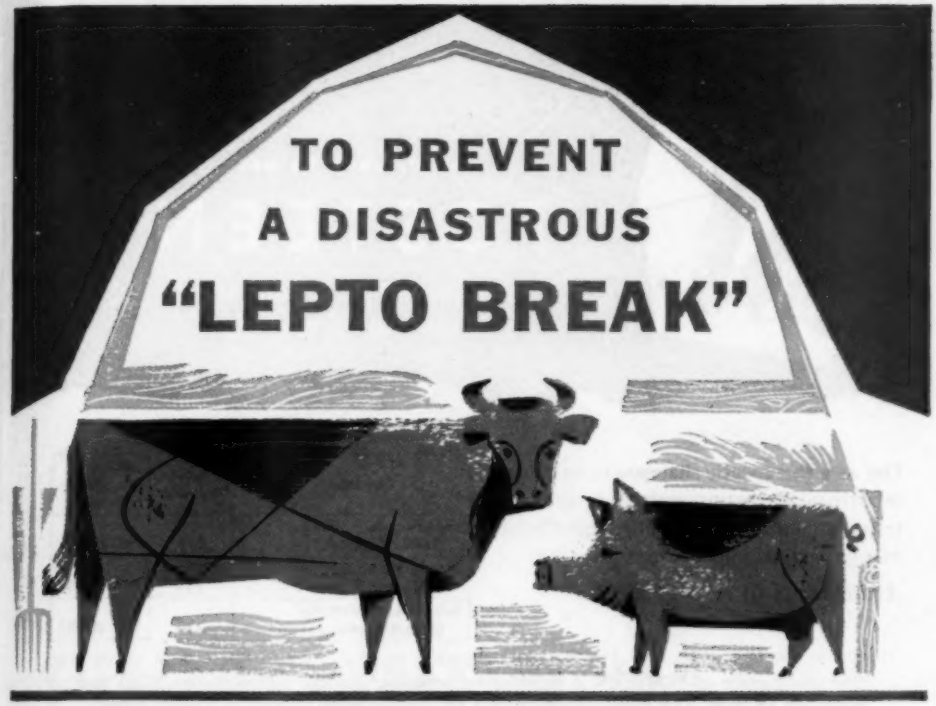

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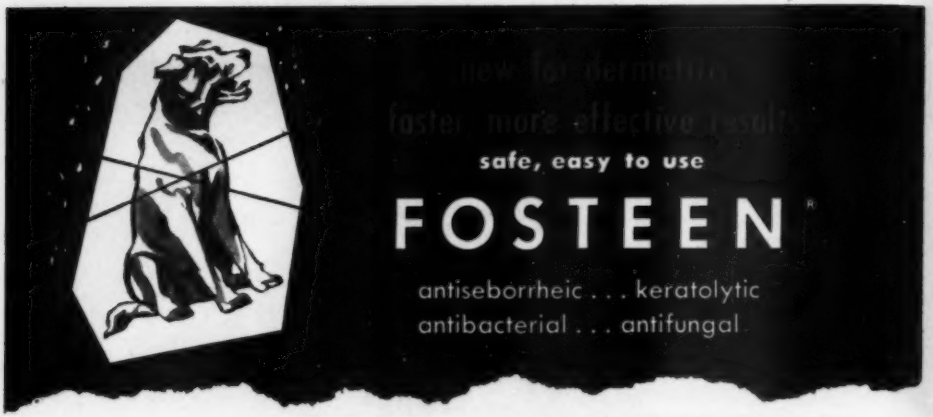

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REFERENCES: 1. Mosier, J. E., and Coles, E. H.: Vet. Med. 53:649 (Dec.) 1958. 2. Belloff, G. B.: Calif. Vet. 9:27 (Sept.-Oct.) 1956. 3. Mosier, J. E.: Vet. Med. 52:445 (Sept.) 1957.

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Washington News

Legislative

House Interstate and Foreign Commerce Subcommittee on Health and Safety held hearings April 16, on H.R. 6324, Public Health Service Commissioned Corps Personnel Act of 1959. The bill introduced by Rep. Roberts (D., Ala.), in lieu of H.R. 1077 (see JOURNAL, Feb. 15, 1959, adv. p. 16), substantially same as latter. Changes are technical and clarifying. Dr. Leroy Burney, surgeon general, testified in support of the legislation for the Public Health Service.

New Bills

Social Security.—Among those to amend the Act are: H.R. 6187, to clarify the meaning of the term "disability" relating to payment of disability insurance benefits; H.R. 6188, to reduce the coverage requirements upon which eligibility for disability benefits thereunder are conditioned, both by Rep. Moore (R.,W.Va.); H.R. 6204, Rep. Staggers (D., W.Va.), provide that full benefits (when based upon attainment of retirement age) be payable to men and women at age 60. H.R. 6306, Rep. Cramer (R., Fla.), would remove restrictions on outside earnings by beneficiaries at age 70 (now 72). H.R. 6230, Rep. Anfuso (D., N.Y.), to increase and extend benefits, reduce retirement age, liberalize the work clause under the program, and establish a system of hospitalization, nursing, and insurance within the program; and to liberalize provisions relating to public assistance. H.R. 6393, Rep. Pucinski (D., Ill.), to provide insurance against costs of hospital, nursing home, and surgical service for persons eligible for old age and survivors' benefits.

H.R. 5984, Rep. Rivers (D., S. Car.), would amend Title 10, U.S. Code, to provide more efficient dental care for Army personnel, and for other purposes. In substance, proposed legislation would provide by statute what is now in Army regulations, relative organization, functions, and operation of the Dental Corps and its service. H.R. 5985, Rep. Rivers (D., S. Car.), to amend Chapter 807 of Title 10, U.S. Code, by creating a surgeon general in the Air Force; provides for method of appointment, term of service, duties, etc. Also, would create by law a dental service in the Air Force, provide a chief of that service in grade of major general, appointed by the President, and sets forth to whom responsible, duties, etc.

S. 1628, Sen. Hill (D., Ala.), H.R. 6265, Rep. Roberts (D., Ala.), identical bills, would vest primary responsibilities for the protection of the public health and safety from radiation hazards in the Public Health Service, HEW Department.

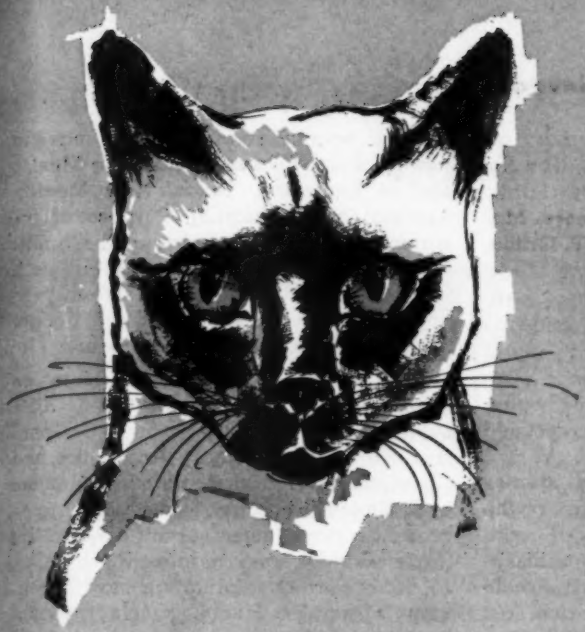
H.R. 6417, Rep. Dorn (R., N.Y.), would have Congress establish a 12-member commission to study the shortage of doctors of medicine in the U.S.

Miscellaneous

Major General Leonard H. Heaton, M.C., presently commanding general, Walter Reed Army Medical Center, was nominated by the President on April 7, 1959, as the surgeon general, U.S. Army.

Dr. Charles G. Durbin was appointed veterinary medical director on April 15, 1959, in Food and Drug Administration, Bureau of Medicine. Dr. Durbin succeeds the late Dr. John H. Collins, under whom he served as associate director.

Dr. Fred J. Kingma, who joined the Veterinary Medical Branch, Food and Drug Administration in July, 1957, will succeed Dr. Durbin as associate veterinary medical director.



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And now another product from Affiliated Laboratories . . . Affiliated Brand Feline Distemper Vaccine, prepared from virus-bearing tissues of infected cats. It is chemically inactivated and bacteriologically sterile.

Complete vaccination against feline distemper consists of two doses of 2cc each of Affiliated Brand Feline Distemper Vaccine. Injections are made subcutaneously with 7 to 10 day interval. Potency of the vaccine is determined for each serial by protection tests on susceptible kittens. Also safety and sterility tests are conducted on the vaccine.

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Produced for and sold to graduate veterinarians only

Washington News—*Continued*

The following Air Force veterinary officers have recently been certified by the American Board of Veterinary Public Health: **Col. Rowland W. Rushmore, Majors Robert A. Crandell, Thomas P. Griffin,** and **William V. Howells.**

Massachusetts declared modified-certified brucellosis-free by U.S.D.A. effective March 31, 1959. Fifteen other states, Puerto Rico, and the Virgin Islands were previously certified. In addition, 816 counties in 30 other states have been certified free.

Mexico–U.S. screwworm field studies underway. The joint effort is part of the Mexican-United States program of cooperation discussed by **President Eisenhower** and the president of Mexico, **Adolfo Lopez Mateos,** at Alcapulco, Mexico, last February. U.S.D.A. Agricultural Research Service personnel are working with Mexico and southwestern states to make a survey of screwworms in northern Mexico and in Louisiana, Texas, New Mexico, Arizona, and California. Purpose of the survey is to learn more about the habits of the screwworm there and determine if the method of combatting the screwworm, now used in southeast U.S., can be applied in Mexico and the Southwest.

The Seventh Annual Symposium on Antibiotics will be held Nov. 4-6, 1959, Mayflower Hotel, Washington, D.C. Sponsors are the two journals, **Antibiotics and Chemotherapy,** and **Antibiotic Medicine and Clinical Therapy.** Those planning to present a paper must submit abstract by September 14, and manuscript by Oct. 15, 1959. Further information may be obtained from Dr. Henry Welch, Director, Division of Antibiotics, Food and Drug Administration, Washington 25, D.C.

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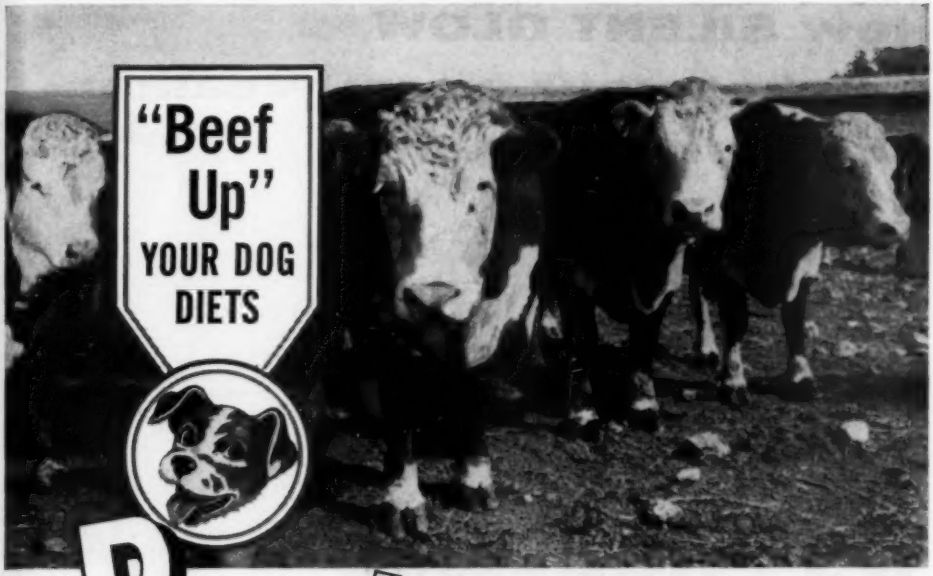

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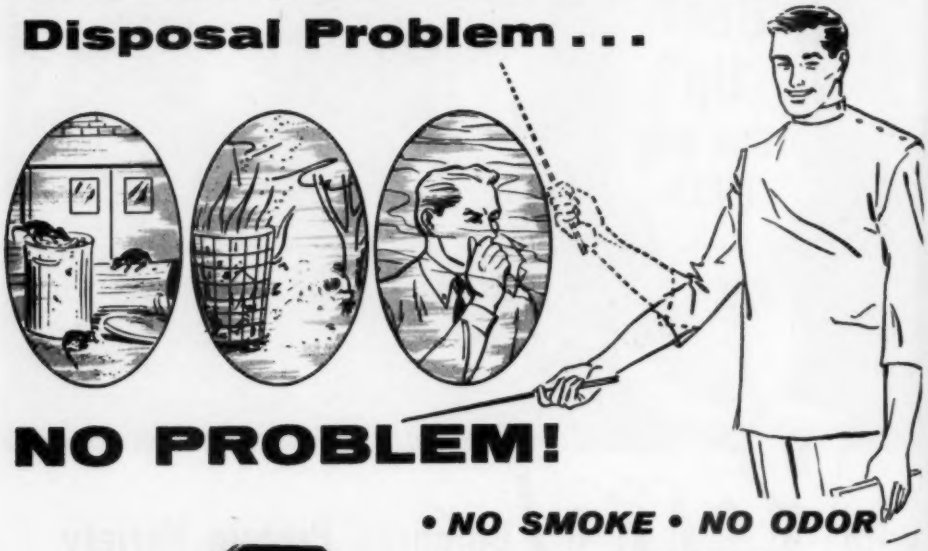

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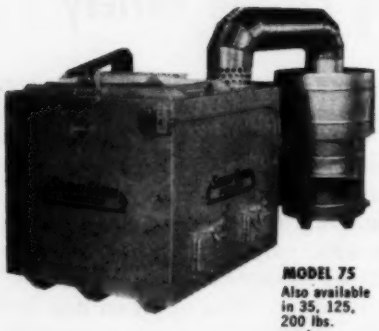

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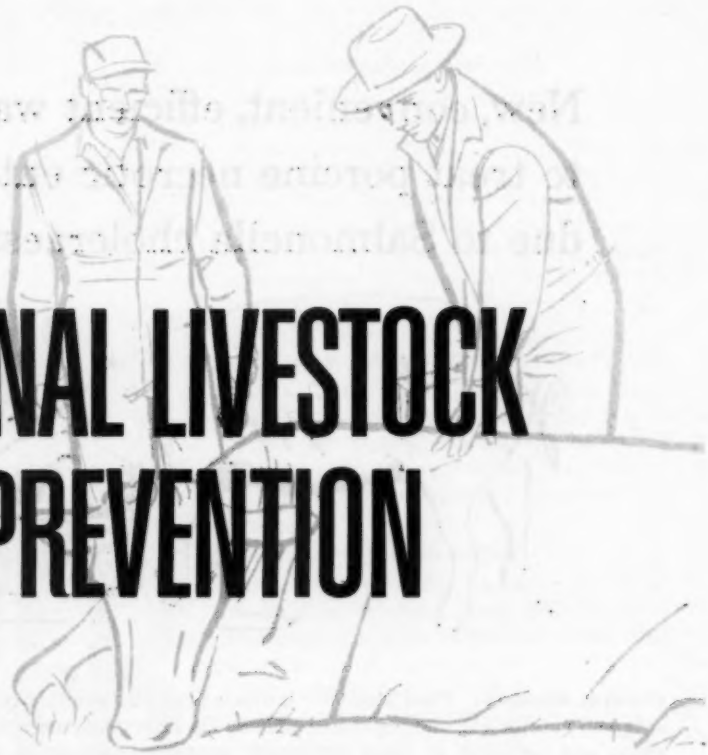

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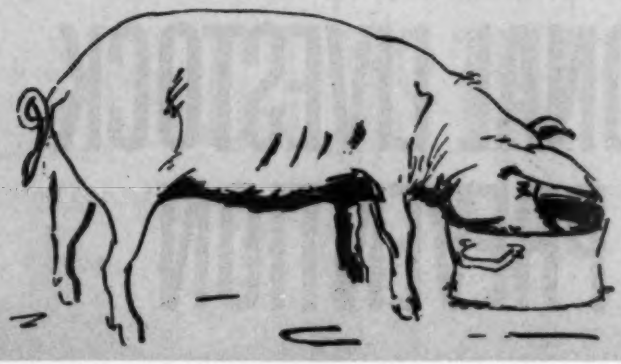

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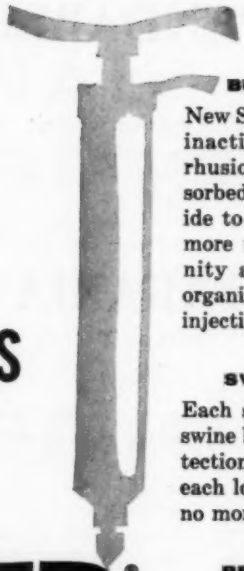

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Surgical Correction of Patellar Ectopia in the Dog

RALPH C. VIERHELLER, D.V.M.

Whittier, California

STIFLE JOINT anomalies are common in toy breeds of dogs. In our practice, the frequency with which they involve the patellae of toy breeds, especially Toy Poodles, almost rivals the incidence of coxofemoral dysplasia in certain of the larger breeds. The current popularity of diminutive dogs is increasing the opportunity to study these defects. Congenital medial ectopia of the patella is perhaps the most severe of the deformities (fig. 1).

The term "patellar ectopia" is used to distinguish congenital fixed malposition of the patella from traumatic dislocations and intermittent luxations. Obviously, no luxation has occurred when the anatomic defects surrounding the joint have precluded patellar articulation with the trochlea from birth.

DESCRIPTION

Patellar ectopia exists from birth. It may be unilateral or bilateral. The stifle appears narrow from a lateral view, and broad from in front or behind. Afflicted dogs stand in a more squat position than normal. Bilaterally-affected animals assume almost the attitude of defecation. The upper limbs form an acute angle with the body. When the dog is picked up and held so that the long axis of the body is vertical, the legs cross at the hocks.

Closer examination of an affected leg reveals that the tibial tuberosity, as well as the patella, is located medial to the normal anterior location. On palpation, it will be found that no amount of manipulation will bring the patella firmly into its normal position. In a high percentage of cases, palpation of the trochlear portion of the femur reveals an absence of the central groove and trochlear ridges.

Fig. 1—Typical posture of dog affected with patellar ectopia.

Locomotion is characteristic. The gait is wobbly, as neither stifles nor hocks move in a straight line. The limbs appear to be abducted even though the feet are being placed nearer the central line between the feet than normal. Dogs affected bilaterally hop in rabbit fashion when attempting to move rapidly.

REVIEW OF LITERATURE

Several procedures have been devised for the correction of recurrent patellar luxation. Patellar desmotomy[3] and reinforcement of the lateral ligament of the patella[4] have become standard methods. A simplified technique using wire instead of fascia

Dr. Vierheller is a small animal practitioner in Whittier, Calif.

The author thanks Dr. P. C. Olson, Hollywood, Calif., for the illustrations.

in the latter operation has been advocated.[5] Removal of the patella[2] will relieve pain in some cases. Patellectomy corrects no anatomic defect, but permits the quadriceps tendon to slip over the medial condyle with less pain to the subject.

One company* advocates use of their electrocautery equipment. It is claimed that pin-point cautery will strengthen and shrink the lateral patellar ligament. One writer[1] has described an operation for treatment of the rarely-occurring lateral luxation of the patellae using a portion of the pectineus tendon. Another[6] has outlined a radical cuneiform osteotomy of the shaft of the femur near its distal third. A method of partial or total transplantation and grafting of the tibial tuberosity into a position anterolateral to where it is found in medial luxation or medial ectopia has been shown by still another.[7]

All of the aforementioned procedures have merit in selected cases. In my opinion, however, none of them provides a complete solution to the problem of patellar ectopia. An effort has been made to combine parts of several techniques into a practical operation (fig. 2-5).

PRESURGICAL PREPARATION AND SURGICAL PROCEDURE

The patient is prepared for surgery in a routine manner. Sedation or tranquilization followed by either epidural or intravenous general anesthesia is satisfactory for us. Thorough clipping, scrubbing, and preparing the skin with a suitable antiseptic precede draping and application of stockinette to the leg to be reconstructed. Relatively aseptic technique is mandatory, as open joint procedures are involved. As an additional safeguard, a presurgical intramuscular injection of 300,000 units of procaine penicillin is given.

A skin incision is made on the lateroanterior aspect of the leg. The normal curvature of the limb is followed from the proximal one third of the thigh to the proximal one third of the leg below the stifle. Skin and subcutaneous connective tissue are carefully stripped from the fascia lata and crural fascia.

Two stab wounds, about ¼ inch apart, are made in the fascia lata near the patella. Only the fibers attached to the patella are included between the punctures. From each of these wounds, straight scissors are pushed upward in the direction of the fibers. The fascia strip included between the two incisions is freed from the underlying connective tissue and muscle. It is then detached at its uppermost end. The fascia strip is tucked under the reflected skin to remain until used in another step of the operation.

The incision through the fascia lata is continued from the distal end of the patella downward, paralleling the straight patellar ligament. Deepening the incision through the synovial membranes exposes the stifle joint. If the trochlea is inadequate or totally lacking in ridges and a central groove, a shallow groove is carefully pared in the articular cartilage. An effort is made to approximate the appearance of a normal trochlea.

Then the quadriceps tendon is undermined by blunt dissection with a small hemostat. When the hemostat meets the medial femoral fascia, an incision is made over the end of the forceps. This incision is enlarged along the medial side of the tendon, patella, straight patellar ligament, and tibial tuberosity.

Deepening the medial side incision to include the synovial membranes has been avoided whenever possible. In some cases, however, it has been necessary to incise the medial side of the femoropatellar joint capsule as completely as was done on the lateral side. This frees all structures from the quadriceps muscle belly down to the remaining fascial attachment of the tibial tuberosity. Initially, we had some apprehension in regard to radical cutting of the joint capsule on the medial side. The lateral shifting of structures makes good surgical repair of the synovial membranes nearly impossible. However, healing has been uncomplicated in these cases.

To place the quadriceps tendon, patella, and straight patellar ligament in a straight line bisecting the trochlea requires moving the tibial tuberosity into an anterior position. One method[7] requires the detaching of some of the tendon of origin of the tibialis anterior muscle and the preparation of a new bed for the tibial tuberosity. A simplified method of performing this transplant has proved entirely satisfactory.

The tuberosity is cut free from the medial side. For this purpose a thin, sharp osteotome about ½ inch wide is used. With a little pressure and a slight rocking motion, the bone is severed through to the opposite periosteum and crural fascia. The fascia is not cut laterally or distally from the bone fragment. The support and nutrition provided to the fragment by these

*Cameron Surgical Specialties, Chicago, Ill.

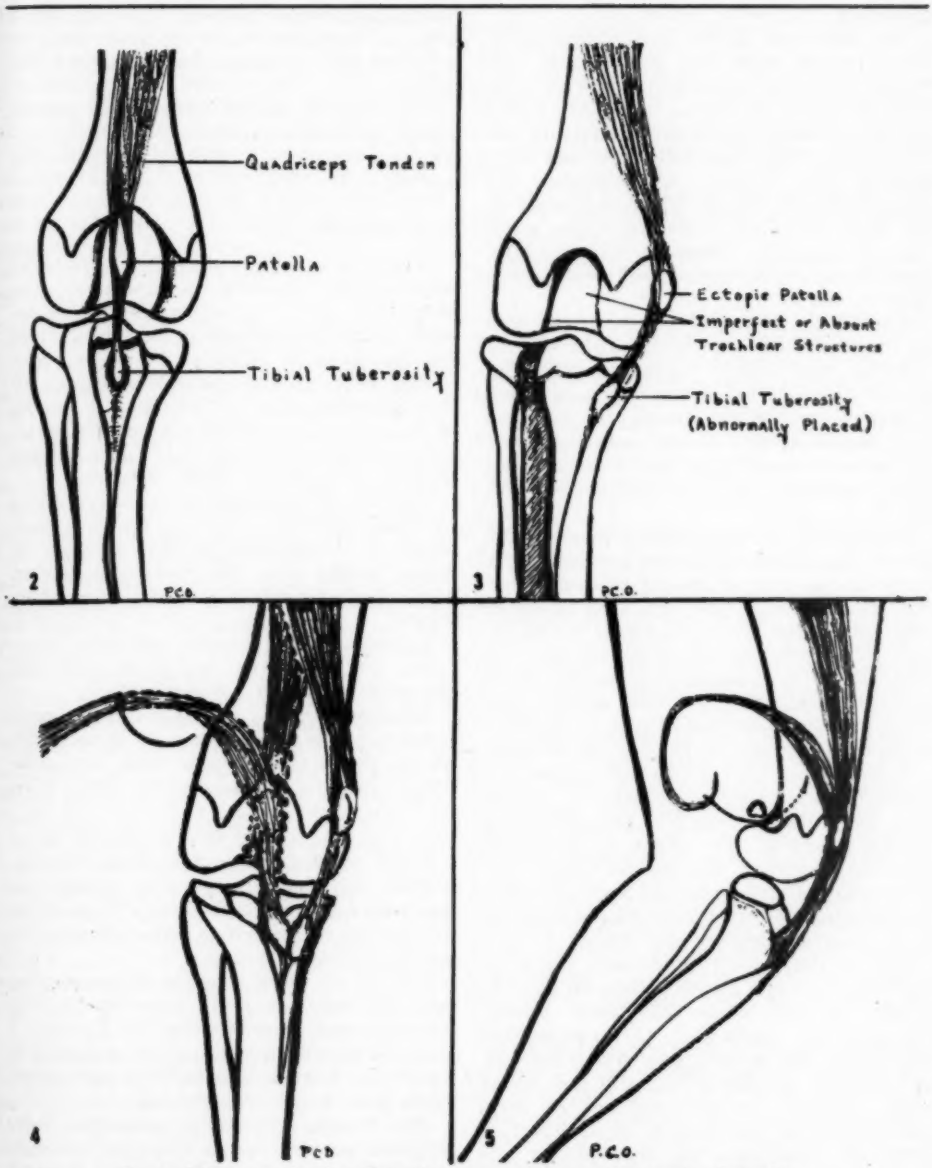

Fig. 2—Stifle joint of a dog, illustrating structures in normal anatomic relationship.

Fig. 3—Ectopic patella with accompanying anatomic aberrations.

Fig. 4—Dotted lines illustrate the position of patella, tibial tuberosity, and related structures after relocation. Needle is attached to strip of fascia lata.

Fig. 5—Method of anchoring lateral patellar ligament.

tissues is essential to the success of the operation.

The tuberosity is now free to move easily when pushed from the medial side, the crural fascia acting as a hinge. The fragment of bone is prevented from being pulled upward by the attached periosteum and fascia distally. The tibial tuberosity and crest develop from a center of ossification not associated with the proximal epiphysis of the tibia.[4] For this reason, a single linear cut will free the tuberosity (in a young dog) from all osseous attachment to the shaft of the tibia.

The tibial tuberosity is now drawn into an approximately normal position on the anterior aspect of the proximal extremity of the tibia. To bring this about, a stitch is placed, medial to lateral, through the detached tuberosity. A full curved cutting needle armed with strong nonabsorbing suture material such as stainless steel wire Ga. No. 30 is used.

The needle is next pushed through the crural fascia and through a portion of the nonarticular part of the lateral condyle of the tibia. It is surprisingly easy to stitch through the cancellous bone near the epiphyses of long bones in young subjects. In older dogs, it sometimes is necessary to stitch through the tibiofibular articulation. The stitch is tied while a surgical assistant holds the tuberosity in the desired position.

An artificial lateral patellar ligament is created by anchoring the strip of fascia lata which was prepared in an earlier step of the operation. The fibers of the biceps femoris overlying the lateral fabella are parted so that this sesamoid may be located by palpation. A full curved fascia needle is then inserted through the fibrous attachments of the fabella or through the adjacent shaft of the femur. When all but the eyelet of the needle has been pushed through, the fascia strip is threaded into the eyelet. The strip is now drawn through the bone or fabellar attachment and pulled taut. Traction is continued on the strip until it holds the patella in articulation with the trochlea. The free end of the fascia strip is attached to the fascia over the patella. Any remaining length is doubled back and stitched to the taut portion.

Surgical openings in the lateral part of the joint capsule and in the fascia lata are repaired with small interrupted sutures. Fine stainless steel wire is satisfactory for this purpose. The rent in the medial crural fascia and, when involved, the underlying synovial membranes, is repaired only by suturing the subcutaneous fascia over the wound.

The skin is closed either with closely placed interrupted sutures or with a continuous mattress suture, preferably the former.

POSTSURGICAL CARE

Since the operation described eliminates mechanically unsound forces upon the structures involved, no fixation is necessary. Allowing freedom of movement from the beginning is a help in preventing prolonged stiffness and possible ankylosis of the femoropatellar articulation. Freedom of movement also helps accomplish whatever stretching of the quadriceps tendon that its new location may require.

The wound is dressed by smearing a film of ointment (Tydrin**) on the skin incision. As further protection, a strip of gauze sponge over the surface is held in place by liquid adhesive applied around its edges.

Intramuscular procaine penicillin injections, 300,000 units, are given daily for three or four days postsurgically.

Healing is rapid, and fair locomotion is commonly evident within a remarkably short time. Often there will be some weight-bearing within two or three days.

DISCUSSION

Since executing my first successful operation for the correction of patellar ectopia on Jan. 6, 1958, I have performed the surgery as described in this paper on 11 additional dogs.

Of the 12 dogs, 4 required surgery on both hindlegs; thus, 16 stifle joints were reconstructed. Eleven were Toy Poodles; 1 was a Pomeranian. All except 2 ranged in age from 2 to 5 months. The two exceptions were 9 to 10 months old.

The 2 older dogs were somewhat more difficult surgical cases than the younger ones. Freeing the quadriceps tendons, patellae, and tibial tuberosities presented greater problems. Stitching through bone was more difficult. It was found necessary in both cases to stitch through the femorotibial articulation when anchoring the

**Tydrin is produced by Pitman-Moore Co., Indianapolis, Ind.

tibial tuberosity. One of the older dogs had previously been subjected to patellectomy and had a large synovial saccule above the medial epicondyle of the femur. The saccule was removed and repairs were made in the synovial membranes during the course of the reconstructive surgery.

While the older dogs were more difficult surgical cases, and the recovery periods were longer, both have become sound of stance and gait. Experience to date indicates the best age for surgery to be 2 to 5 months. Even younger ages might be satisfactory.

Two of the dogs that were subjected to a bilateral operation, while sound in every other respect, continued to stand and move in a somewhat crouched position after healing was complete. It was evident that the skin and tendons had not stretched sufficiently to permit full extension of the stifles. Owners of these dogs were instructed to manually extend the involved joints daily to expedite stretching of skin and tendons. This instruction has been quite successful on 1 dog, which now stands and moves without crouching. In the other dog, the results were not as favorable. Perhaps the physiotherapy was executed less diligently.

Since the problem of patellar ectopia is confined to toy breeds, it appears that selective breeding for small size has uncovered a genetic factor. If the problem is heritable, it is questionable whether these dogs should be used for breeding. However, inasmuch as many are kept as household pets, it would seem an act of mercy to rescue them from a lifelong crippling defect. Furthermore, the status of the veterinary profession is enhanced more by the offer of a constructive solution than by a recommendation of euthanasia.

SUMMARY

A surgical operation for the correction of congenital fixed malposition of the patella is described. The operation is based on an attempt to place all structures involved in proper anatomic relationship. Principle features of the technique include freeing the quadriceps tendon, patella, and straight patellar ligament; manufacturing a lateral ligament from fascia lata; carving a trochlea; and relocating the tibial tuberosity. A limited number of cases indicates the procedure to be a workable solution to the problem of ectopic patellae.

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Clinical Care and Prognosis in Canine Respiratory Coccidioidomycosis

Since 1955, hundreds of cases of disseminated coccidioidomycosis have been reported from enzootic areas in California and Arizona. Great strides have been made in clinical recognition of the disseminated disease.

A casual review of the literature might lead to the belief that disseminated coccidioidomycosis is the only form that can be recognized clinically when, in point of numbers, the primary pulmonary infection is more common and can be suspected when a respiratory infection is encountered following even a transient exposure in the enzootic areas. Such exposure is common when dogs from all over the United States and Canada compete in field trial competitions in enzootic areas of the Southwest.

Lack of response to broad-spectrum antibiotics and chemotherapeutic agents is adjunct evidence, and radiology can contribute to a diagnosis of coccidioidomycosis, but complement-fixation and precipitin tests on serum will confirm a presumptive diagnosis.

Prognosis in primary pulmonary coccidioidomycosis is favorable, and treatment is symptomatic and supportive.—*C. H. Burger, D.V.M., M.S., Bakersfield, Calif., at 1959 Midwinter Meeting of the California V.M.A. in Davis.*

Veterinary Aspects of Air Pollution Research

EARL J. CATCOTT, D.V.M., Ph.D.

Boston, Massachusetts

THE ROLE of the veterinarian in air pollution research was described briefly in an address given at the A.V.M.A. convention in 1957.[1] The speaker* identified the veterinarian as an established member of the research and field teams investigating air pollution. The potential threat of this environmental contaminant is becoming so ubiquitous that it requires serious consideration. The general nature of this problem will be discussed, as will some of the veterinary activities under way or already accomplished.

The term "air pollution" is quite descriptive. It generally is used in reference to man-made contamination with industrial wastes, substances resulting from combustion of fuel, and radioactive fall-out. The number, type, concentrations, and combinations of air pollutants present at any given place and time appear to be limitless. A combination of gases, particulates, and fog commonly has been referred to as "smog." However, it is now apparent that fog is not a necessary component of the dense atmospheric hazes known as smogs.

RECOGNITION AS A HEALTH HAZARD

Certain health hazards of toxic airborne pollutants have been recognized for many years. For example, the toxicity of fluoride emissions for animals has been well defined. Certain of the effects of radioactive fall-out on human and animal health have been measured. During the past decade, health authorities and the general public have developed an increasing concern over the potential hazard of continued exposure to less well-known air pollutants.

While there has been, historically, some concern about air pollution, the awareness of its threat as a health hazard seems roughly parallel to the ever-increasing industrialization and urbanization which has occurred during the twentieth century. Currently, the most severe air pollution generally is found in and near large urban centers where the basic components of "smogs" are emitted in large quantities.

Already we have some direct evidence, as well as some suggestive leads, concerning the broad potentials of this menace. First, there have been major air pollution disasters causing death. Second, there have been lesser disasters, or incidents, which caused widespread morbidity. Third, there have been instances of public alarm due to the irritating effects of air pollutants on the eyes and upper respiratory tract. Fourth, many components of polluted air, when present in high concentrations, have been demonstrated to have biological effects; e.g., silicosis, anthracosis, carcinogenesis,[3,5] and chronic pulmonary disease.[7] Fifth, extensive economic loss through damage to plants and property have been caused by air pollutants.[6]

In 1955, U.S. Public Law 159 gave official recognition to the need for investigation and control of air pollution. The Public Health Service has the major responsibility for conducting the research and training program outlined by this law. Assistance to state or other local governmental authority has been provided upon request.

While air pollution obviously exists where large quantities of pollutants are emitted, there are other environmental factors which increase its accumulation to proportions that attract public attention and concern. These may be illustrated by the conditions which prevail in Los Angeles County, California. The topography of this region is like a basin, which favors the containment of air pollutants. The lateral wind movements are mild during much of the year. Wind dispersal of the accumulated pollutants is further hampered by the frequent occurrence of temperature inversions which restrict the vertical movement of air. Simply put, such areas have periods of inadequate ventilation.

Combinations of these or similar topographical and meteorological features occur in many areas of the United States where air pollution is considered a potentially

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serious economic and health problem.

The most enlightening observations of the effects of air pollution on health have been made during or after the occurrence of acute episodes. The best known of these occurred in London in 1952, Poza Rica, Mexico, in 1950, the Meuse River Valley in 1930, and Donora, Pennsylvania, in 1948. At these locations persistent, dense air pollution was associated with human morbidity and mortality rates which were markedly increased above the expected.

Following the air pollution episode at Donora, a U.S. Public Health Service survey[4] disclosed that appreciable numbers of animals were reported to have become ill and that some died during the week of intense pollution. While dogs were allegedly affected in greater numbers than other species, owners of cats, rabbits, calves, and poultry reported the occurrence of illness and death among these species.

The illnesses of animals attributed to the Donora smog were most frequently characterized by respiratory distress. The signs of illness included cough, retching and emesis, sneezing, dyspnea. Cases of calf pneumonia were attributed to the smog by farmers. The reports of illness at Donora were clouded by the inability to identify specific pollutants; veterinarians were unwilling to indict the smog as a cause for animal morbidity or mortality.

During the London fog in 1952, a number of prized cattle which had been grouped for exhibition showed acute respiratory distress during the period of severe air pollution.[2] Five of them died, 11 were subjected to emergency slaughter, and over 40 others developed signs which were attributed to the smog. Sulfur dioxide was identified as the chemical most likely responsible for the increased morbidity and mortality.

A related sulfur compound, hydrogen sulfide, was held responsible for the unusual number of animal deaths which occurred during the air pollution disasters at Poza Rica and in the Meuse River Valley.

Since 1950, intensive research efforts have been made in the United States to define the effects of air pollution on the health of man. While the temporary irritative and annoying features of smog, such as nasal and ocular irritation, sinusitis and headache, have been experienced by many people, it remains to be demonstrated that more serious consequences of exposure to smog do or will occur following prolonged exposure.

Interest in the effects of air pollution on animals has generally developed as a corollary to the concern about its influence on human health. Studies in which animals have been exposed experimentally to air pollutants have been prompted by the need for specific information concerning the toxicity of various known pollutants.

NATURE OF ANIMAL INVESTIGATIONS

There also has been a direct concern about the injurious effects of air pollution on animals because of the potential economic loss associated with this hazard. This is illustrated by the extensive research devoted to the problem created by air-borne fluorides.

During 1957, research and investigations were conducted by the author in an effort to determine whether injury occurs to animals which have been exposed to air pollution in the Los Angeles area. Reports of excessive poultry morbidity constituted the sole lead which appeared to have any authenticity. A field study was designed to pursue this possibility. Other research was guided in part by reports concerning the highly toxic and carcinogenic properties of certain air pollutants for laboratory animals.

As a background for the field studies, animal mortality and production records were obtained from the areas in and near Los Angeles which experience severe air pollution. These records revealed no apparent relation with the occurrence of smog. Veterinarians and animal breeders in the county generally were unwilling to indict smog as a serious influence on animal health. This reluctance may reflect the difficulty of assigning clinical reactions to subtle influences which produce their effects only after prolonged periods.

During the summer of 1957, a survey was made of the respiratory tracts from 51 dogs which were identified prior to their euthanasia by age and period of residence in Los Angeles County. Gross and microscopic examinations of the tracheobronchial epithelium and pulmonary parenchyma failed to reveal differences between the animals from smog and non-smog areas. No evidence of the pathological changes which had been encountered in laboratory

animals exposed to synthetic smogs could be found.

In another experiment, two groups of male Leghorn chickens were observed for three months in areas which supposedly have contrasting degrees of air pollution. Two chickens from each flock were necropsied weekly. All body tissues were examined grossly, and portions of the respiratory tracts were studied microscopically. Both groups of birds remained healthy and their growth, vigor, and appearance were considered normal. There were no significant differences observed between the tissues from the two groups of chickens.

A second experiment involving chickens currently is being conducted in Los Angeles County. This study, designed to last one year, has been extended to include measurements of egg production, fertility, and hatchability. Accurate weight gains are being recorded. The chickens are housed in adjoining buildings, one of which admits filtered air only.

DISCUSSION AND CONCLUSION

With the exception of the relatively few acute episodes, serious health effects due to air pollution have not been recognized. However, the more subtle effects on man or animals which may be associated with prolonged exposure to air-borne irritants have not been studied adequately.

While there is considerable effort and money being expended to control contamination from industrial sources, it is likely that man-made air pollution will continue to increase for some time. It is essential that we persist in efforts to define the specific injurious effects of the identifiable pollutants, of their chemical combinations, and of the gross mixtures compounded through the varied aerial expulsions created by man's activities.

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Veterinary Medicine in the U.S.S.R.

Veterinary medical activities in the Soviet Union are guided and controlled by the central government in Moscow through the Veterinary Collegium of the Ministry of Agriculture. Many diseases which we know and deal with, such as tuberculosis, brucellosis, anthrax, hog cholera, fowlpox, and anaplasmosis, are reported to occur in Russia. Other diseases exist there which are not present in the United States, and foot-and-mouth disease is one of their most serious problems.

The veterinary science delegation from the United States which toured the U.S.S.R. last summer reports that, while Soviet veterinary science may lag behind ours in some respects, the Russians are determined to close the gap.—*C. D. Van Houweling, D.V.M., Washington, D.C., at 1959 Meeting of the Ohio State V.M.A. in Columbus.*

Animal Colostrum for Human Babies

The feasibility of transferring passive immunity to human infants by feeding bovine colostrum has been suggested. Unlike calves, pigs, and the young of many other animal species, newborn infants deprived of their mothers' colostrum are no more susceptible to bacterial infection than those who get it. (The human placenta is the principal if not the sole site for transfer of maternal antibodies.)

When cows and sows were immunized during gestation, with paratyphoid "A" vaccine, their colostrum had a high titer of agglutinins against that organism. However, when this colostrum was fed to nine premature infants when between 5 and 45 hours of age, none retained any of this agglutinin in their serums.

Newborn babies in one hospital remained free of diarrhea and other infections when given 2 oz. daily of bovine colostrum. There were no deleterious effects. A plan to give some babies full feedings of bovine colostrum until 3 days old, while leaving others as controls, is being considered.—*Certified Milk (Jan.-Feb., 1959): 4, 5.*

Electrocardiography of Tranquilized Cattle. I

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THE EMPLOYMENT of tranquilizing drugs in animals as a means of therapy, of control, and of acclimating the animal to a changed environment has become popular with both veterinarians and livestock men.[4-8] Many questions regarding the action of this class of drugs on various organs and systems of the animal, as well as the economic practicability of their use, remain to be answered.

This is a report of a study to determine the appearance and diagnostic significance, if any, of electrocardiograms of 8 tranquilized cows. All electrocardiogram (ECG) tracings were made in accordance with the procedures previously reported.[3]

MATERIALS AND METHODS

Four tranquilizing drugs of phenothiazine origin were employed. Each drug was used on 2 cows. The agents used included: chlorpromazine (Thorazine*), which is 10-(3-dimethylaminopropyl)2-chlorophenothiazine hydrochloride; perphenazine (Trilafon*), which is 1-(2-hydroxyethyl)-4-[3-(2-chloro-10-phenothizinyl) propyl] piperazine; promazine (Sparine*), which is *gamma*-dimethyl amino-n-propyl phenothiazine hydrochloride; and ethyl isobutrazine (Diquel*), having a chemical structure of ethyl-3(dimethylamino-3′ methyl 2′ propyl)-10 phenothiazine.

A preinjection electrocardiogram was made, the animal given an initial intravenous dose of the drug, sufficient to cause a state of tranquilization, and another tracing made immediately. Other tracings were made in 15 minutes, 30 minutes, and one hour after the injection, and continued hourly until the animal appeared to be recovering from the effect of the drug. The next day, at 7:30 a.m. and again at 5:30 p.m., a preinjection tracing was made, the tranquilizer was injected, then one tracing was made immediately and another one 30 minutes later.

This procedure was repeated for four days on each animal. Approximately two weeks following the series of nine injections, another tracing was made. The cows were sold for slaughter one to three weeks following the completion of the studies and their hearts were examined for gross lesions.

RESULTS

Chlorpromazine (150 mg.) was administered intravenously to 2, 750-lb. Holstein-Friesian heifers, 2 and 2½ years old, respectively. Although auscultation had revealed no abnormalities in the heart of either animal, the heart rate in both increased after the first few injections but showed less of a tendency to do so after later injections. Abnormal arrhythmias did not appear.

The P wave, P-R, QRS, and Q-T intervals, as well as the systolic index, exhibited a wider range of values in each animal than occurred in a single normal cow, but the values obtained were within the range of values for all normal cows.[3] Some modification in the amplitudes of wave deflections was noticed but the classification of the electrocardiogram did not change as a result of the medication.

The appearance of the tracing made approximately two weeks after the series of injections of chlorpromazine revealed no detectable abnormalities in rate, rhythm, impulse conduction or appearance, nor were any abnormalities noticed by auscultation. The hearts revealed no gross lesions at the time of slaughter.

Perphenazine (100 mg.) was given intravenously to a 900-lb. Jersey cow, 7 years old, and to an 850-lb. Jersey, 2½ years old. A stethoscopic examination revealed no abnormalities in the heart of either cow before each injection. The heart rates after injection exhibited a wider range than in a single normal cow[3] but the changes in rates were independent of drug injections. Abnormal arrhythmias did not appear.

The values recorded for P wave, P-R, QRS, and Q-T intervals and systolic index exhibited a wider range in each cow than was noticed in a single normal cow but the values were within the limits for all normal cows.[3] A moderate change occurred in the amplitude of some waves but the classification of the electrocardiogram did not change.

From a thesis submitted by the senior author, in 1958, to Iowa State College, in partial fulfillment of the requirements for the M.S. degree. Dr. Lank is now at Louisiana State University, Baton Rouge, La. Dr. B. W. Kingrey is head, Department of Veterinary Medicine and Surgery, Iowa State College, Ames.

*Thorazine is produced by Pitman-Moore Co., Indianapolis, Ind.; Trilafon by Schering Corp., Bloomfield, N.J.; Sparine by Wyeth Labs., Inc., Philadelphia, Pa.; and Diquel by Jensen Salsbery Labs., Inc., Kansas City, Mo.

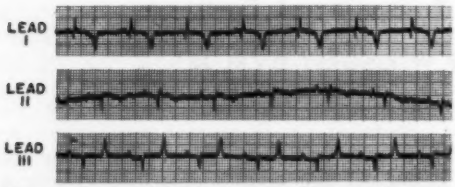

Fig. 1—The preinjection electrocardiogram of cow 7, 2½ years old.

The tracing made approximately two weeks after the completion of the series of injections revealed no abnormal rate, rhythm, or impulse conduction, nor was any abnormality noticed upon auscultation of the hearts. Gross lesions were not seen in the hearts at time of slaughter.

Ethyl isobutrazine (225 mg.) was injected intravenously into a 900-lb. Guernsey cow, 5 years old, and into a 900-lb. Jersey, 8 years old. A preinjection auscultation had revealed no abnormalities in the heart

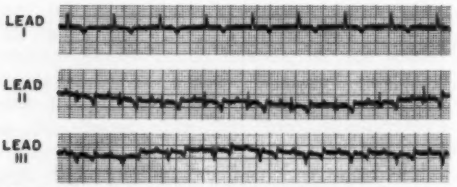

Fig. 3—The preinjection electrocardiogram of cow 8, 18 months old.

of either cow. Following the fourth injection in the Jersey and after each succeeding injection, she fell down. Within five minutes, she could be encouraged to rise and stand unassisted with no further reaction until she was injected again.

Abnormal arrhythmias appeared in neither cow but the heart rate in both usually declined about 10 cycles per minute after each injection. The P wave, P-R, QRS, and Q-T intervals and the systolic index values were within the normal range.[3]

The electrocardiograms made approximately two weeks after the series of injections compared closely with pretreatment tracings and auscultation of the hearts revealed no abnormalities at the post-treatment time. There were some minor variations in amplitude and appearance of waves in the tracings but no change in the classification of the electrocardio-

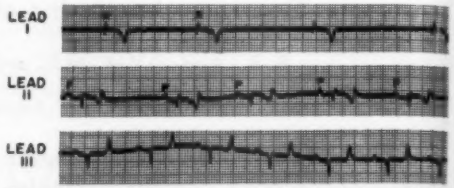

Fig. 2—The electrocardiogram of cow 7 immediately after the eighth and ninth injections of 250 mg. of promazine. Lead I shows a sinus arrest with the R waves of the ventricular contractions not preceded by any discernable P wave. Lead II shows sinus arrhythmia with variations in cycle lengths as measured from P wave to P wave varying more than 0.12 second. The vibratory appearance of the isoelectric line is due to muscular trembling.

gram. Gross lesions were not found in either heart.

Promazine (250 mg.) was administered intravenously to cow 7, a 2½-year-old, 740-lb. Guernsey, and to cow 8, a 1½-year-old, 700-lb. Guernsey. Stethoscopic examination of the hearts before treatment revealed no

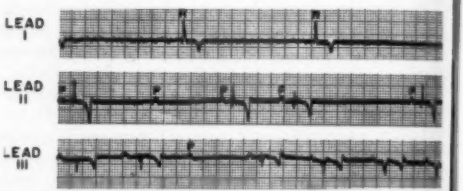

Fig. 4—The electrocardiogram of cow 8 immediately following the ninth injection of 250 mg. of promazine. Lead I shows a sinus arrest with no P wave preceding the R wave of the ventricular contraction. Lead II shows a sinus arrhythmia with a variation of more than 0.12 second between P waves of successive cardiac cycles. A partial heart block is exhibited as a ventricular contraction, does not follow the second labelled P wave in the tracing. Lead III exhibits a partial heart block with no ventricular complex following the labelled P wave.

abnormalities. The heart rate in cow 7 ranged from 59 to 95 with changes independent of drug injection while, in cow 8, the rate varied from 60 to 100 with an increase of a few cycles usually observed 30 minutes after the injection.

The values for the P wave, P-R, QRS, and Q-T intervals, and the systolic index, although ranging a little more than was noticed in a single normal cow, were within the range of all normal cows.[3] A definite irregularity, which lasted about a minute, appeared on the tracings of cow 7 following the eighth and ninth injections. When com-

pared with the preinjection tracing of this cow (fig. 1), distinct irregularities were seen following the last two injections (fig. 2). Lead 1 shows sinus arrest with sinus arrhythmia being noticeable in lead II.

Beginning with the fourth injection and appearing consistently through the last or ninth injection, a temporary interference of about a minute in duration occurred in the conduction of the impulse in cow 8. Her electrocardiogram before any injections were made (fig. 3), compared with the abnormalities in impulse conduction (fig. 4), shows sinus arrest in lead I, sinus arrhythmia and partial atrioventricular block in lead II, and a partial A-V block in lead III following the ninth injection.

In both animals, the electrocardiogram recorded 30 minutes after the demonstrated interference compared favorably with the pretreatment tracing. An examination of both hearts approximately two weeks after completion of the injections revealed no abnormalities either with a stethoscope or on the electrocardiogram. At slaughter, no gross pathological abnormalities of the hearts were found.

DISCUSSION

Extremely abnormal electrocardiograms were not produced as a result of a single or by a series of twice-a-day injections of chlorpromazine, perphenazine, or ethyl isobutrazine. The intervals, heart rate, and systolic index, although fluctuating more than was observed in a single normal cow, were within the range of all normal cows, and were not considered extremely abnormal or detrimental to the heart.

The peculiar reaction exhibited by the Jersey cow, in which she fell to the floor after the intravenous administration of 225 mg. of ethyl isobutrazine, caused no abnormality on the tracing.

Abnormal arrhythmia was not detected in any cow given these tranquilizers, so it is logical to assume that no interference with the impulse-conducting mechanism occurred as a result of these injections.

The 2 animals given promazine demonstrated a disturbance in conduction different from anything noticed in any normal cow studied.[3] Sinus arrest in man has been considered rare, usually transitory, and due to vagal effects.[1] In sinus arrest an ectopic center, usually in the A-V node, assumes control of the heart and the resulting ventricular beat is slower, yet regular in rhythm.[2] This apparently occurred in both cows injected with promazine.

The A-V block noticed in cow 8 prevented some impulses from the normal pacemaker to activate a ventricular systole. Vagal stimulation is considered one of the causes of A-V block in man,[2] and is a logical explanation of the phenomenon in this animal, as a slowing of the heart rate occurred with the temporary interference in conduction of the excitatory impulse. At necropsy, gross pathological changes of a permanent nature were not observed in the heart of either cow given promazine.

SUMMARY

When chlorpromazine, perphenazine, ethyl isobutrazine, or promazine were each given to 2 cows in a single daily injection, or in a series of injections twice daily, electrocardiograms revealed a greater range in interval lengths, systolic index value, and in heart rate than in untreated normal cows. Temporary interference in the conduction of the excitatory impulse followed the last few injections of promazine. As employed in this study, the temporary abnormalities produced by the four tranquilizers were not believed to be a serious detriment to the bovine heart.

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A Survey of Swine Brucellosis and Leptospirosis in Wisconsin

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MUCH PROGRESS has been made toward the elimination of brucellosis from Wisconsin cattle. Considerable information is available about the prevalence of leptospirosis in cattle. Less information is available about these diseases in other species.

The purpose of this survey was twofold: to gain information as to the number of swine infected with these diseases, and to compare the efficiency of four serological tests for brucellosis. Tissues from all animals reacting to the rapid plate agglutination test were used for bacteriological cultures in an attempt to isolate Brucella organisms. When sufficient serum was available, serological tests were conducted for the presence of *Leptospira pomona* antibodies.

MATERIALS AND METHODS

Specimens for this survey were furnished by a local slaughtering establishment.* Satisfactory serum samples were obtained from the heart clot of 1,104 sows representative of various regions of the state. Also obtained from each sow were a submaxillary lymph node and a portion of spleen for bacteriological culture purposes.

The blood clots were collected in large-mouth, screw-top jars and then placed in plastic bags along with the portions of spleens and lymph nodes. Each bag was given the tatoo number of the sow previously identified at the holding pens. The tatoo identified the locality from which the sow originated.

BRUCELLOSIS

The serum was poured off, centrifuged at 2,500 r.p.m. for three minutes, and tested for Brucella agglutinins using both the rapid plate method and the standard tube method at dilutions 1:25, 1:50, and 1:100. The plate test was incubated for eight minutes at 22.5 C. and the tube test at 37 C. for 48 hours. When a reaction was observed on the rapid plate test, two additional tests were performed, the acidified plate antigen method (A.P.A.) and the 56 C. for 18 hours tube method (56 C. test).

It has been shown[5] that a high percentage of the nonspecific agglutination reactions for Brucella in bovine serum is inhibited if the pH of the serum-antigen mixture is adjusted to 4.0 to 3.5 by the addition of suitable amounts of concentrated acetic or lactic acid to the standard plate antigen. The acidified antigen used in this survey was adjusted to pH 3.75 with a Beckman pH meter.

A technique[1] has been described whereby the tube agglutination test, when incubated at 56 C. for 16 to 24 hours, eliminated or reduced the titer of nonspecific reactions of serums from swine in herds considered free from infection. Serum samples from swine herds naturally or artificially infected with *Brucella suis* did not show a marked diminution of titer at the higher temperature.

In all cases, both tube and plate antigen were supplied by the Agricultural Research Service, U.S.D.A. Antigen for the A.P.A. test was prepared by adding 0.12 cc. of 85 per cent lactic acid to 2 cc. of plate antigen. This preparation was made fresh daily. Testing by the A.P.A. method was done at the 1:25 dilution and readings recorded at 15 minutes. Any degree of agglutination was considered positive.

Spleens were cultured by searing the surfaces, entering the tissue with sterile loop, and streaking on W medium.[4] Lymph nodes were dipped in 75 per cent alcohol, flamed, cut with sterile scissors, and the cut surfaces smeared on W medium plates. Plates were incubated for five days at 37 C. aerobically and under 10 per cent CO_2.

Suspected Brucella colonies were first

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The authors acknowledge the assistance of the other staff members of the Wisconsin Animal Diagnostic Laboratories and Dr. David Berman, Veterinary Science Department, University of Wisconsin.

*Provided through the courtesy of Oscar Mayer & Co., Madison, Wis.

TABLE 1—Comparison of Brucellosis Reactions of Serum Samples from Swine as Obtained on the A.P.A. and 56 C. Tests with Those Obtained on the Rapid Plate and Standard Tube Tests

Serum sample No.	Rapid plate reaction	Standard tube reaction	56 C. test reaction	A.P.A. reaction
A-33	+++	+++	+++	Positive
C-20	+++	+++	+++	Positive
D-3	+−−	+−−	+−−	Positive
A-11	+I−	+I−	I−−	Positive
C-30	+++	+++	+++	Negative
F-2	+−−	+I−	+−−	Negative
D-4	I−−	I−−	−−−	Negative
M	I−−	−−−	I−−	Negative
A-44	+−−	+−−	−−−	Positive
B-20	++−	−−−	−−−	Positive
B-11	++−	−−−	−−−	Positive

screened by a microscopic slide agglutination test using pooled undiluted high-titer bovine serum from Brucella reactors. Colonies giving a positive reaction were then tested for carbohydrate utilization, using 1 per cent carbohydrate in phenol red broth base (Difco). Hydrogen sulfide production was tested in S.I.M. medium (Difco), and urease production in bacto urea agar (Difco). Isolated organisms giving reactions atypical for Brucella were discarded.

Those still under consideration were then tested by tube agglutination using known high-titer bovine Brucella antiserum. Growth on Brucella agar mediums containing basic fuchsin 1:80,000 and thionine 1:100,000 was used for species differentiation. Guinea pigs were inoculated intraperitoneally with a suspension of cells from each culture and examined six weeks later for lesions typical of Brucella infection.

Results.—A comparison of the results obtained on the rapid plate and standard tube tests for brucellosis, with any degree of reaction recorded as positive, shows that of the 1,104 sow serums tested, 145 (13%) reacted to the plate method and 190 (17%) to the tube method.

When the 145 sow blood samples reacting to the rapid plate method for brucellosis were tested by the 56 C. and the A.P.A. methods, eight (5.5%) only reacted to the 56 C. test; seven (4.8%) to the A.P.A. test. The reactions to the A.P.A. and 56 C. tests, with a comparison to the rapid plate and standard tube tests, are shown (table 1).

Thus 94.5 per cent of the reactions were eliminated by the 56 C. tube test and 95.2 per cent by the A.P.A. test. It has been stated[3] that "It is believed a herd can be satisfactorily diagnosed as brucellosis free if two successive agglutination tests 60 days apart on all breeding stock do not disclose titers of 1:100 or higher, and no new animals have been introduced into the herd within 30 days preceeding the final test."

For the purpose of this survey, if we consider reactions of 1:100 or higher on the rapid plate method as being indicative of brucellosis infection, only eight of 145 titers represent infection (table 2).

Of the eight reactors, five were negative to the 56 C. test, and six were negative to the A.P.A. test, indicating that some reactions at 1:100 or higher are nonspecific or they are specific and being missed by the

TABLE 2—Comparison of Reactions of Serum Samples from 8 Swine with Brucellosis Titers of 1:100 or Higher, as Obtained on the Rapid Plate Test with Those Obtained on the 56 C. and A.P.A. Tests

Serum sample No.	Rapid plate reaction	56 C. test reaction	A.P.A. reaction
A-33	+++	+++	Positive
A-22	+++	−−−	Negative
C-20	+++	+++	Positive
C-30	+++	+++	Negative
H-1	++I	−−−	Negative
I	++I	−−−	Negative
L-1	++I	−−−	Negative
N	+++	−−−	Negative

56 C. and the A.P.A. tests. This is an insufficient number of samples to be conclusive. A more thorough comparison of these tests has been made with bovine serums.[5]

No Brucella organisms were recovered from tissues taken from the 145 pigs showing reaction to the rapid plate test. It was found that in most instances isolated organisms giving positive slide agglutination tests were Proteus spp. As stated,[2] "Proteus OX_{19} seems to share an antigenic factor with *Brucella suis*."

LEPTOSPIROSIS

Tests for leptospirosis were made on 443 swine serum samples by the serum agglu-

tination-lysis method at dilutions 1:10, 1:100, 1:1,000, and 1:10,000. Also, 627 samples were screened by a plate agglutination test[7] and all positive serums subjected to the agglutination-lysis test.

Results.—It was found that 4.1 per cent of 443 samples reacted to the agglutination-lysis test; nine samples at 1:10, seven at 1:100, and three at 1:10,000. Considering a reaction of 1:1,000 or over as indicative of infection, the prevalence was 0.7 per cent.

Of the 627 samples screened by the plate method, five (0.8%) reacted. When these five reactors were tested by the agglutination-lysis method, they all reacted at the 1:10,000 dilution or higher. This is evidence that the screen plate test is a reliable diagnostic aid for identifying high-titered *L. pomona* serums.

SUMMARY AND CONCLUSIONS

A survey was conducted to better evaluate the prevalence of swine brucellosis and leptospirosis in Wisconsin, and to compare four serological tests for brucellosis.

Of 1,104 serum samples from sows selected at random, 13 per cent reacted to the rapid plate test for brucellosis; 17 per cent to the standard tube test.

Of 145 serum samples reacting to the rapid plate test, 5.5 per cent were positive to the 56 C. for 18 hours tube method (56 C. test) and 4.8 per cent were positive to the acidified plate antigen method (A.P.A.). Thus a large percentage of swine reactions may be nonspecific, and either the A.P.A. or the 56 C. test may be a reliable method of screening out nonspecific reactions.

No Brucella organisms were isolated from the 145 sows which reacted to the rapid plate test. Proteus organisms were recovered from lymph nodes which were agglutinated by Brucella serum, which is further evidence of nonspecific reactions.

The agglutination-lysis test for *Leptospira pomona* was positive at 1:1,000 or higher for three (0.7%) of 443 serum samples. The plate screen test was positive for five (0.8%) of 627 samples. Reactors to the screen plate test were all positive at 1:10,000 or higher by agglutination-lysis test, indicating the reliability of the screen plate test.

This survey indicates that the incidence of brucellosis and leptospirosis in Wisconsin swine is low, but the serums of a relatively high proportion of animals react nonspecifically with Brucella antigen.

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New Vaccine for Teschen Disease

Meningoencephalitis of swine (Teschen disease) was responsible for the loss of more than 60 per cent of the swine in Madagascar for a few years. An attenuated vaccine was prepared from central nervous tissues of experimentally infected young pigs, using aluminum hydrochloride. Two or three injections of this vaccine, at 10- to 14-day intervals, induced a good immunity (85 to 90%) in native swine for six months. A booster dose was then necessary.

Since vaccine production by this method required slaughtering of thousands of young pigs, a new method has been introduced, based on culturing Teschen virus on pig kidney epithelial cells. Limited tests have given promising results. Swine breeding, which was greatly decreased for some years, is again assuming importance on Madagascar.—*O. Lalanne, in Off. internat. des Épizoot., 50, (May, 1958): 439.*

Swine Erysipelas in Australia.—Heavy losses in swine, due to erysipelas, are reported in southern Australia.—*J. Agric. South Austral. (Jan., 1559): 288.*

Bovine Brucellosis Eradication

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OVER THE PAST 50 years, brucellosis of livestock has been recognized more and more as a serious economic and public health threat in the United States—a disease impossible to disregard in terms of dollars lost, livestock production, and man's health.

While the estimated annual loss to the cattle industry has dropped some $38 million during the last five years, bovine brucellosis still takes a heavy toll from livestock producers. And even though a marked decrease in the reported incidence of brucellosis in man has occurred each year since 1947, it continues to be one of the most important diseases of animals transmitted to man. In fact, since there are so many recognized difficulties in accurately diagnosing the extent of brucellosis in man, it is obvious that there are probably many more than the 802 cases actually reported in 1958.

Livestock men and veterinarians have recognized for a long time that brucellosis is a serious problem. But it was not until 1934 that a serious effort was undertaken to combat the disease in cattle. Since that year, the cooperative state-federal brucellosis eradication program has faced its full share of roadblocks and delays. Yet in spite of these obstacles, and the trial and error approach upon which the program was based in those early days, progress has been relatively good. Even so, had we not recognized our mistakes—and corrected them as they occurred—these small accomplishments would have been pretty discouraging.

Any attempt to control and eradicate contagious livestock diseases on a national basis must be preceded by an intensive educational or informational program. Groups which have both a direct and indirect interest must be thoroughly familiar with the needs, advantages, and problems concerned with combating the disease if they are to provide needed support. As a matter of fact, some of the earlier difficulties encountered in the brucellosis eradication program were the result of weaknesses in our educational effort.

The cooperative efforts of national, state, and local public health agencies have been an important factor in the success of the brucellosis eradication program. There is no doubt that the program is further ahead today than it might have otherwise been as a result of the public health aspects of the disease.

One reason is that the average producer is showing more concern than ever about the dangers of Brucella-infected animals, both to the health of his family and others. And since he and other groups concerned realize they can't fight the battle alone, it has been much easier to establish a solid foundation for an effective brucellosis campaign.

UNIFORM PROCEDURES

Since 1947, the cooperative brucellosis program has been conducted under uniform methods and rules recommended and approved by the livestock industry, livestock sanitary agencies, and the Department of Agriculture. These procedures were designed to provide the flexibilty needed to handle brucellosis problems under varying herd conditions and still maintain a standard level of efficiency and uniformity.

What are these procedures? Essentially, they consist of: (*a*) test and slaughter, with or without calfhood vaccination; (*b*) test, calfhood vaccination, and temporary retention of reactors; (*c*) calfhood vaccination without testing the herd.

From the standpoint of eradication, it is obvious that testing and elimination of reactors by slaughter is the ideal method. All other procedures are merely preliminary steps and are useful only as a means of reducing infection rates to a level where reactor animals can be removed without serious economic shock to the owner.

Again, from an eradication standpoint, it is equally obvious that until the uniform methods and rules for brucellosis eradication were adopted in 1947, general confi-

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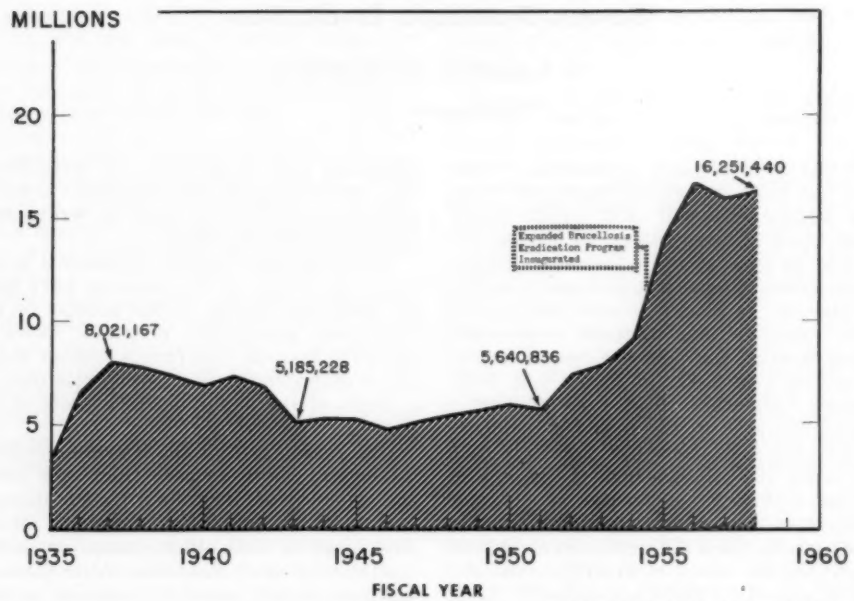


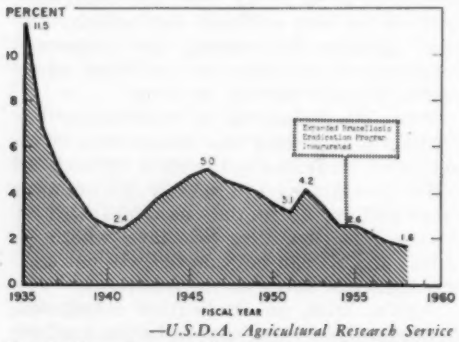
—*U.S.D.A. Agricultural Research Service*

Fig. 1—Yearly volume of official blood serum agglutination tests for bovine brucellosis.

dence in the program was quite sadly lacking. Yet the program gained through the years in spite of this weakness.

TWENTY YEARS' PROGRESS

How far did we come during the 20 years from 1934 to 1954? The results are rather impressive, when you consider the limited scope of the program (fig. 1, 2). For example, during this period, 127 million cattle in 11 million herds were blood tested. And with the exception of those years during World War II when manpower was lacking, the level of blood testing remained fairly constant.



—*U.S.D.A. Agricultural Research Service*

Fig. 2—Percentages of brucellosis reactors disclosed on official blood serum agglutination tests for bovine brucellosis.

Animal infection rates also declined from about 10.0 per cent in 1934 to 2.6 per cent in 1954. At the same time, the number of infected herds dropped from a high of 38.0 per cent to 14.2 per cent.

The use of strain 19 vaccine has shown a consistent increase each year since it was approved as a part of the program in 1941. During the next 14 years, more than 21 million calves were officially vaccinated throughout the United States. There is no question that vaccination has played an increasingly important part in brucellosis eradication. For example, infection has been markedly reduced by wide-scale vaccination in many areas where rates were initially high.

Important, too, is the fact that field experience has shown the value and limitations of strain 19 vaccine. Where vaccination is practiced extensively over a period of years, animal infection tends to be reduced to a low level, but is not entirely eliminated.

On the other hand, in most instances herd infection rates remain fairly constant

over long periods of intensive vaccination.

Thus in the over-all program of brucellosis eradication, the major role of vaccination is to establish a low rate of animal infection. From this point, reactors can be easily and economically eliminated through testing and removal.

THE EXPANDED BOVINE BRUCELLOSIS ERADICATION PROGRAM

In the fall of 1954, the cooperative state-federal brucellosis eradication program was stepped up as a result of additional funds provided by Congress and the various states.

Official activities recorded for the first four fiscal years of the expanded program (1955 through 1958) are compared with those for the preceding four-year period (table 1).

Blood Testing.—During the four-year period of expansion, a total of 63.1 million cattle in 4.4 million herds was blood tested for brucellosis. Of this number, 2.0 per cent of the cattle and 11.9 per cent of the herds showed evidence of infection. This represents an increase of 110.4 per cent in the number of cattle tested, a 73.1 per cent increase in herds tested, and a reduction of 1.3 per cent and 3.2 per cent in respective infection rates.

It is significant that, in spite of broader coverage than ever before, infection rates based entirely on blood test results have continued to decline. During the fiscal year 1958, 16.2 million cattle were blood tested. This level has been approximately maintained over the past three years.

Brucellosis Ring Testing.—Milk and cream ring testing used to identify Brucella-infected dairy herds has been used to an increasing extent over the past four years. In spite of its expanded use, there have been consistent yearly reductions in the percentages of suspicious herds found.

For fiscal years 1955 through 1958, 6.5 million herds were tested. Of this number, 13.9 per cent were classified as suspicious. This is an increase of 159.7 per cent in herds tested and a reduction of 13.1 per cent in the number of suspicious herds found, as compared with the previous four-year period.

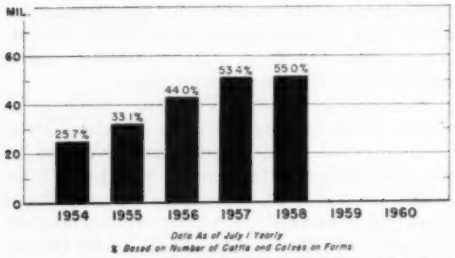
Because of its effectiveness and economy of application, the ring test should be used as widely as possible. This is especially true because, by promptly locating and eliminating new centers of infection before they are responsible for extensive spread of the disease, eradication efforts can be materially strengthened.

Vaccination.—Each year, the accelerated program has shown progressive increases in the number of official vaccinations reported. For fiscal years 1955 through 1958, the cumulative total reached 20.9 million, an all-time high for any similar period since vaccination became a part of the official program. In comparison with the pre-

TABLE 1—Comparative Brucellosis Data Covering the Four-Year Period 1955-1958 and the Preceding Four Years

Activities	Fiscal years					Fiscal years					Total Percentage change (4 years)
	1951	1952	1953	1954	Totals	1955	1956	1957	1958	Totals	
Blood tests											
*Herds tested	565	671	660	696	2,592	985	1,155	1,171	1,177	4,488	+ 73.1
*Reactor herds	72	116	108	96	392	144	156	124	108	532	+ 35.7
(%)	12.8	17.3	16.4	13.8	15.1	14.6	13.5	10.6	9.2	11.9	*** — 3.2
*Cattle tested	5,641	7,491	7,861	9,002	29,995	14,186	16,754	15,913	16,251	63,104	+ 110.4
*Reactor cattle	172	314	268	236	990	365	367	280	260	1,272	+ 28.5
(%)	3.0	4.2	3.4	2.6	3.3	2.6	2.2	1.8	1.6	2.0	*** — 1.3
Reactors slaughtered (%)	40.1	30.6	32.0	51.3	37.6	71.1	89.2	95.1	97.7	87.1	*** + 49.5
Ring test											
*Herds tested	Became official part of program	455	671	932	2,058	1,201	1,728	1,866	1,751	6,546	
										** 5,345	+ 159.7
*Suspicious herds		136	176	243	555	279	256	213	164	912	
										** 633	+ 14.1
(%)	FY 1952	29.9	26.2	26.1	27.0	23.2	14.8	11.4	9.4	13.9	*** — 13.1
*Vaccinations		2,542	3,179	3,688	3,999	13,408	4,381	4,773	5,501	6,277	20,932	+ 56.1
Certifications											
New counties		8	18	46	33		46	169	241	490	
Counties removed		20	93	79	11		1	48	6	8	
Total certified counties		420	345	312	334		379	500	735	1,217	

*Thousands; **three year total for comparison purposes (1956-57-58); ***actual difference.



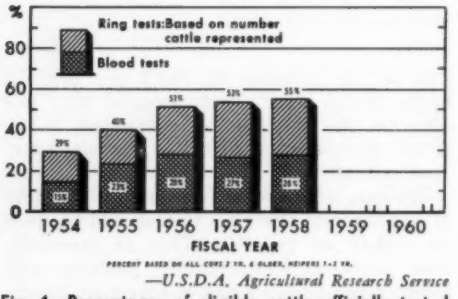
—*U.S.D.A. Agricultural Research Service*

Fig. 3—Cattle under supervision in the official bovine brucellosis eradication program.

ceding four years, these figures represent an increase of 56.1 per cent.

With the growing realization that the protection afforded by strain 19 vaccine is usually relative, vaccination has been more carefully used in recent years. However, since the protection it provides is a relative thing, there will be a continuing need for maintaining a high level of induced resistance in our cattle population until the brucellosis threat is completely removed.

Results of the Expanded Program.—Cattle under supervision, cattle tested, and calves vaccinated for fiscal years 1955, 1956, 1957, and 1958 are compared graphically (fig. 3-5) with those in 1954, the year preceding expansion of the brucellosis program.



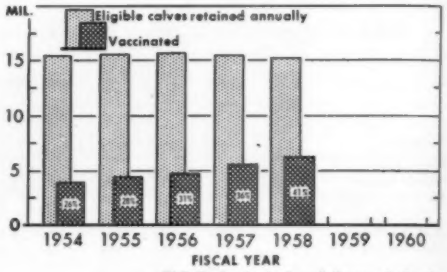
—*U.S.D.A. Agricultural Research Service*

Fig. 4—Percentages of eligible cattle officially tested for brucellosis.

In the case of cattle under supervision (fig. 3), 55.0 per cent were covered by the brucellosis program as of June 30, 1958. This compares with 25.7 per cent on June 30, 1954, and reflects an unbroken trend of increases each year during the accelerated campaign.

Depicted graphically (fig. 4) is the percentage of annual coverage of blood and ring tests for fiscal years 1954 through 1958. These determinations are based on the estimated number of cattle eligible for testing.

For fiscal year 1958, combined blood and ring tests represented 55 per cent of all female cattle over 1 year of age in the country. This is almost twice the coverage made during 1954, the year immediately before the expanded program became operative. It is also interesting to note that ring test results are accounting for almost



—*U.S.D.A. Agricultural Research Service*

Fig. 5—Percentages of eligible calves officially vaccinated against brucellosis.

50 per cent of the total cattle tested each year.

For fiscal year 1954 and the first four years of the expanded program, comparative levels of vaccination with respect to eligible calves are shown (fig. 5).

While yearly increases were not spectacular, they were consistent. With 41 per cent of our calves officially vaccinated in fiscal year 1958, we are approaching the point where resulting protection levels will be increasingly valuable from the standpoint of nation-wide control and eradication of brucellosis. It is hoped that these annual increases will continue to the point where at least 50 per cent of the eligible calves are vaccinated each year. Under these conditions, many of our more difficult eradication problems will be either greatly reduced or removed entirely.

Area Certifications.—Every effort is being made to encourage complete area work leading to early certification of all areas under the program. The modified certified designation means that infection rates have been reduced to a level not exceeding 1 per cent for animals and 5 per cent for herds.

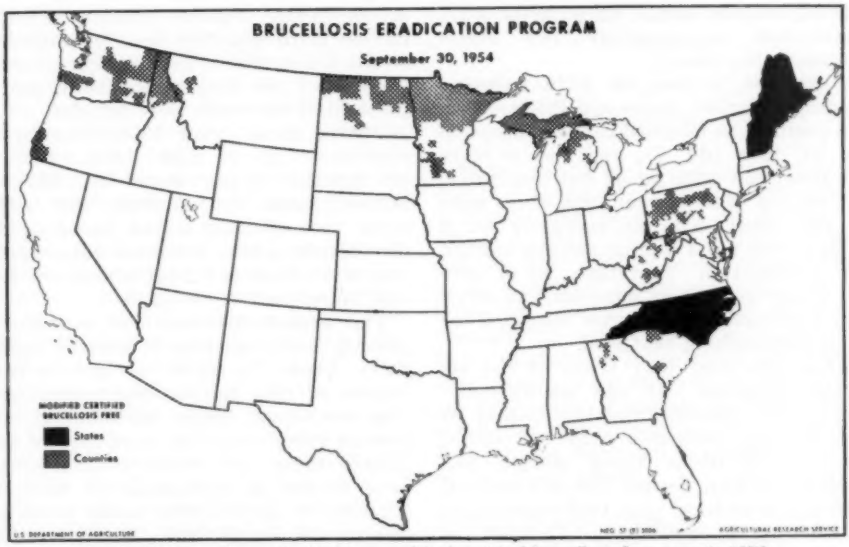


Fig. 6—States and counties listed as modified certified brucellosis-free areas in 1954.

Because work with individual herds tends to lessen the effectiveness of field operations, at this stage of the brucellosis program there is a greater need than ever to limit program activities to complete areas. By operating in this manner, we are in a much better position to establish and maintain modified certified areas.

Advances made during the past four years in qualifying areas have been satisfactory. In fact, this phase of the program is progressing at a faster rate than expected (fig. 6, 7). As of Sept. 30, 1954, just before the expanded program was started, there were only 334 counties, including three complete states, listed as

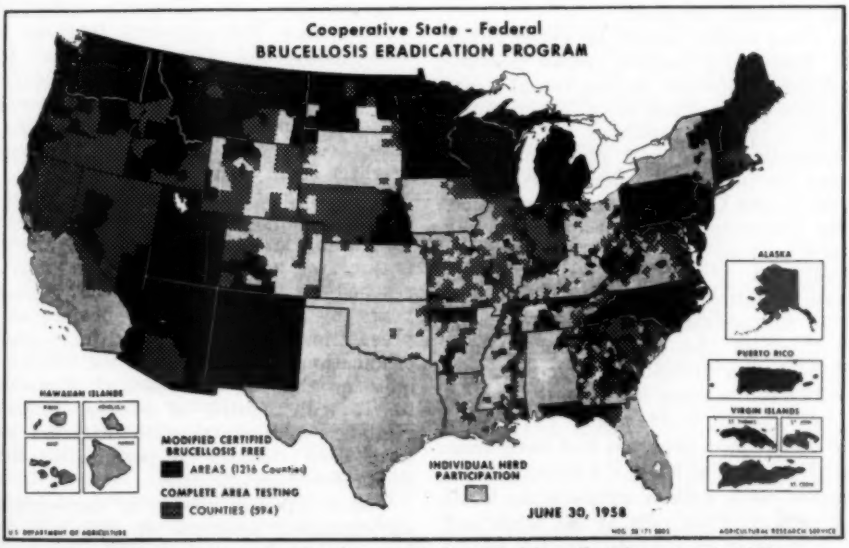


Fig. 7—States and counties listed as modified certified brucellosis-free areas in 1958.

modified certified areas. These areas were concentrated in relatively few states throughout the county.

In contrast, a total of 1,216 counties, including 15 entire states and Puerto Rico, were qualified as modified certified areas on June 30, 1958 (fig. 7), and one or more such areas now exist in all but five states.

At the end of fiscal year 1958, there were also 594 other counties operating on a complete area basis leading directly toward early certification. Therefore, as of this date, 57 per cent of all domestic and territorial counties were either certified or rapidly approaching that goal.

During the first four years of the accelerated program, 946 new county certifications were recorded for the country as a whole. This compares with 105 initial county certifications listed during the previous four-year period. The 490 original certifications in fiscal year 1958 exceeds the 1957 high by 241 counties.

SUMMARY AND DISCUSSION

Although significant progress is being made in the nation-wide effort to combat bovine brucellosis, this disease continues to rank high on the list of animal diseases having important economic and public health aspects. The economic and human health factors involved justify the fullest cooperation possible between livestock sanitary officials, public health agencies, and the livestock industry.

Too much credit cannot be given public health people for helping make possible the advances recorded during recent years in the brucellosis eradication program.

In spite of the problems encountered, the campaign has been responsible for reducing the incidence of bovine brucellosis throughout the United States, Puerto Rico, and the Virgin Islands from approximately 10.0 per cent in 1935 to 1.6 per cent on June 30, 1958.

These results confirm the value of present procedures and underline the effectiveness of the blood serum agglutination test, the brucellosis ring test, and strain 19 vaccine when intelligently used.

As of June 30, 1958, nearly four years of the accelerated program had been completed. During this time, 4.4 million herds containing 63.1 million cattle were blood tested, with 11.9 per cent of the herds and 2.0 per cent of the cattle classed as reactors. These figures compare with 2.5 million herds and 29.9 million cattle blood tested during the preceding four years. Of these, 15.1 per cent of the herds and 3.3 per cent of the cattle were infected.

During fiscal year 1958, blood testing continued at a high level. For the 12 months ending June 30, 1958, 1.1 million herds representing 16.2 million cattle were officially tested. Based on blood test results alone, infection rates for the year were down to 9.2 per cent of the herds and 1.6 per cent of the cattle.

The brucellosis ring test continues to provide important help in locating infected dairy herds. In spite of the increased volume of ring testing, the percentage of ring suspicious herds continues to drop. During 1958, ring tests were applied to 1.7 million herds, of which 164,000 (9.4%) were classed as suspicious. In 1954, 26.1 per cent of the 932 ring tested herds were classed as suspicious. Results of this nature could not be achieved if the ring test were not serving its intended purpose as a screening device.

The advantages of conducting the brucellosis eradication program on an area basis are increasingly evident. And by operating in this manner, added protection can be given to herds that are free of infection.

During fiscal year 1958, 490 counties were added to the list of modified certified areas. This is the largest number so far recorded for any 12-month period and represents a 100 per cent increase over fiscal year 1957. Considering that 1,217 counties were qualified as modified certified areas on June 30, 1958, the prospects for achieving this designation for the entire country at an early date became brighter each year.

With 15 states and Puerto Rico already certified completely and 32 other states conducting area-type programs, there is reason to believe this status may be reached nationally within the next five years by maintaining the project at its present level. Although the ultimate goal of eradication is still ahead of us, there is no question that we can reach it if we want to. It will require, of course, continued vigilance and effort after infection rates have been reduced to permissible limits for modified certification.

The manpower needs for implementing an expanded program of this size have been extremely great. For the most part,

veterinary practitioners have cooperated well in helping meet these service requirements. As of June 30, 1958, there were 7,149 accredited veterinarians signed up for fee-basis work on the brucellosis program. As might be expected, all of these men do not participate at the same time. In fact, only 60 per cent of those listed are engaged in program work during any given period.

Several states continue to report difficulties in meeting service requests. In some cases, practitioners are not available in the area involved. In others, the problem can be attributed to lack of interest on the part of local practitioners.

With success or failure of the entire program depending largely on cooperation of the profession, it is most important that everyone concerned provide as much assistance as possible. Final eradication of brucellosis will reflect high credit to modern veterinary medicine in the United States and establish an enviable record of accomplishment.

Livestock Changes for 1959

The estimated total number of animals in the United States, given in millions, and the approximate percentage change from the averages for the previous ten years are as follows: beef cattle, 64 (the highest in history)—up 22 per cent; dairy cattle, 33—down 7 per cent; hogs, 57—up 4 per cent; sheep, 33—up 3 per cent; horses, 3—down 49 per cent; chickens, 383—down 7 per cent; and turkeys, 6—up 16 per cent.

Twelve states, ten of them in or close to New England, had fewer cattle than the previous ten-year average. The greatest increase was in the corn belt, the southeastern states, and the Pacific Coast states. Texas had the most cattle (8.5 million), followed by Iowa (6.5 million), Nebraska (4.9 million), and four other corn belt states with more than 4 million cattle.—*Am. Cattle Producer (March, 1959): 10.*

Chlorpromazine for Tetanus

In a test of drugs which would suppress the convulsions of tetanus without interfering with respiration, chlorpromazine was found to be 250 times as effective as mephenesin and 50 times as effective as thiopental. Acetylchlorpromazine was ten times as potent as chlorpromazine.—*J.Am. M.A. (Feb. 7, 1959): 637.*

Prevalence of Bovine Coccidia in Wisconsin

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In the spring of 1958, a survey was conducted in the 71 Wisconsin counties to determine the prevalence of bovine coccidia. A total of five individual fecal samples was collected from one dairy farm in each county, farms considered by the individual county agents to be "above average" in management, sanitation, and dairy production. However, perhaps ten of the farms visited could have been judged below average Wisconsin standards. Sanitation and management practices have been found to be important in relation to levels of infection affecting susceptible hosts.[3,4]

MATERIALS AND METHODS

The fecal samples were collected from the individual animals, either directly from the rectum or immediately after observed defecation. Careful sanitation of equipment was observed during the collection. Material for examination was obtained from young stock ranging in age from 1 to 3 weeks up to 18 months. Ten samples were collected from adult animals at two farms which lacked young stock.

A total of 355 samples was obtained and examined for coccidial oocysts. The sugar flotation technique commonly used for nematode egg counts at the parasitology laboratory of the Veterinary Science Department was used on 10-Gm. samples (specific gravity of the sugar solution, 1.25).[5] The coccidial oocysts were identified microscopically (x 430).

RESULTS

Each herd examined had at least one sample containing oocysts, although 57 samples (16.5%) were negative. A total of 28 herds had one negative sample, nine herds had two negative samples, one herd had three negative samples, and two herds

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The authors thank L. R. Davis and G. W. Bowman of the U.S.D.A. Regional Animal Disease Research Laboratory at Auburn, Alabama, for instruction and training in laboratory techniques, and species identification. The identification of species of bovine coccidia was supplemented by reference to Christensen[2] and to Torres and Ramos.[6]

TABLE 1—Results of a Survey Conducted in the Spring of 1958 to Determine the Prevalence of Bovine Coccidia in 71 Wisconsin Counties

Species	Incidence in samples	Percentage of the total	Distribution by counties
Eimeria bukidnonensis	17	4.8	15
Eimeria subspherica	38	10.7	28
Eimeria auburnensis	160	45.1	64
Eimeria alabamensis	148	41.7	58
Eimeria cylindrica	70	19.7	44
*Eimeria bovis	146	41.1	64
*Eimeria zurnii	91	25.6	50
*Eimeria ellipsoidalis	154	43.4	64
Eimeria canadensis	125	35.2	56
Eimeria brasiliensis	9	2.5	8

*Species considered pathogenic under field conditions.[1] The total number of samples examined was 355.

had four negative samples. The total number of oocysts recorded by the flotation technique in 10-Gm. samples of feces ranged from 0 to 21,788. The number of species observed in positive individual samples ranged from one to eight. *Eimeria auburnensis, Eimeria ellipsoidalis, Eimeria alabamensis,* and *Eimeria bovis* were the predominant species. The findings of the survey are summarized (table 1).

Nine species of bovine coccidia previously reported from the United States, together with *Eimeria brasiliensis,* which apparently had not been reported from this country, were found in Wisconsin. Data on the occurrence and fluctuation of species of coccidia in hosts of different ages are indicated by incidence expressed by percentage in the samples (table 2).

DISCUSSION

The survey is interpreted to indicate widespread prevalence of bovine coccidia in Wisconsin. Bovine coccidiosis is not a new disease in this state but, when it has occurred, it frequently has not been recognized. Prior definite evidence of its widespread presence has been lacking. Most research on bovine coccidiosis has been conducted in the southern states where the disease is given considerable recognition due to losses among the cattle population. Bovine coccidiosis has been found in all areas of Wisconsin in a northern climate. Consideration should be given to the probable losses caused by the disease in these cattle.

SUMMARY

Five fecal samples were collected from individual dairy animals principally ranging in age from 1 to 3 weeks to 18 months at one farm in each of the 71 Wisconsin counties; ten individual samples were collected from adult cows. The total number of oocysts found in these samples ranged from 0 to 21,788/10 Gm. of feces. The infection was found in cattle in every county.

TABLE 2—Prevalence of Eimeria Species of Bovine Coccidia Arranged According to Host Age, and Indicated by Percentage Incidence in Samples

Species	2 wk.-1 mo.	1½ mo.	2 mo.	2½ mo.	3 mo.	4 mo.	5 mo.	6 mo.	7 mo.	8 mo.	9 mo.	10 mo.	11 mo.	12 mo.
E. bukidnonensis	.....	10.6	2.3	16.7	3.9	1.2	6.2	1.9	.....	5.0	.....	.....	14.2	6.3
E. subspherica	10.0	15.8	6.8	16.7	19.6	7.3	4.2	5.6	.....	.....	5.5	20.0	14.2	6.3
E. auburnensis	27.5	57.9	47.7	41.7	49.0	45.5	56.3	20.4	45.0	15.0	22.2	20.0	71.4	68.8
E. alabamensis	22.5	36.8	36.8	50.0	51.0	33.1	37.5	20.4	61.4	30.0	22.2	40.0	42.8	31.3
E. cylindrica	15.0	15.8	36.4	33.3	19.6	7.3	14.5	7.4	.....	15.0	22.0	40.0	28.6	18.8
E. bovis	27.5	57.9	56.4	50.0	41.1	35.6	35.4	18.5	20.0	30.0	38.8	50.0	42.8	50.0
E. zurnii	22.5	10.5	27.3	33.3	25.5	32.2	29.2	13.0	34.4	30.0	33.3	20.0	.....	31.3
E. ellipsoidalis	32.5	52.0	36.4	75.0	35.3	52.0	50.0	22.2	43.3	100.0	2.8	20.0	42.8	50.0
E. canadensis	15.0	52.6	25.0	33.3	25.5	29.5	45.8	11.1	45.0	80.0	22.2	30.0	57.1	56.3
E. brasiliensis	.....	.....	12.3	.....	3.9	25.3	.....	.....	.....	.....	5.5	.....	.....	.....
Negative samples	32.5	5.3	15.9	16.7	13.7	14.9	10.4	9.2	.....	5.0	5.5	40.0	.....	6.3
Total samples	40.0	19.0	44.0	12.0	51.0	46.0	36.0	27.0	11.0	10.0	9.0	10.0	7.0	16.0

All species of bovine coccidia known to be enzootic in the United States were found in Wisconsin. The number of species in positive samples ranged from 1 to 8. A total of 57 (16.5%) of the individual samples was negative for oocysts.

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Report on Zoonoses

The following items are from *Morbidity and Mortality*, weekly reports issued by the U.S. Department of Health, Education, and Welfare.

Blastomycosis.—In West Virginia, a 51-year-old man who had scratched a pimple on his left nostril two years previously had gradually developed a purplish lesion which had invaded both nostrils and the left maxillary and frontal sinuses. A cancer was suspected but the biopsy diagnosis was North American blastomycosis. He is being treated.—*Feb. 6, 1959.*

In Arkansas, blastomycetes were isolated from ulcerating lesions on the nose, jaw, and leg of a 78-year-old man. Also, the complement-fixation titer was 1:32. Several months previously, biopsies had been negative for carcinoma and no organisms were cultured.—*March 27, 1959.*

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Tetanus.—In Illinois, there were 8 cases of human tetanus, with four deaths, in 1958. A 2½-year-old boy, who had been given tetanus toxoid at 1 year of age and a booster dose on Oct. 5, 1958, cut his hand on an ax on October 18 and developed tetanus nine days later. He was hospitalized, given tetanus antitoxin, and was completely recovered in another nine days. —*Feb. 13, 1959.*

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Coccidioidomycosis.—In Arizona, during 1958, 780 human cases of coccidioidomycosis, including seven deaths, were reported. In dogs, 240 cases were reported, most of them disseminated infections. Of 132,000 cattle slaughtered under state and federal inspection, 1.7 per cent had coccidioidal lesions.—*Feb. 13, 1959.*

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Salmonellosis.—In Georgia, last fall, an estimated 1,000 persons became ill following a pork barbecue. *Salmonella california* was isolated from 62 persons, including four barbecue workers, and from six samples of the pork and from the meat-chopping block. The infection may have been derived from the hogs and transferred to the food by a worker.—*Feb. 20, 1959.*

In a Massachusetts hospital, where the patients in wards were served eggnog as a dietary supplement, 104 persons became ill in seven days. *Salmonella typhimurium* was recovered from stool specimens from most of these patients. No illness occurred in wards where eggnog was not served. Salmonella were not found in persons who prepared the eggnog.

In Wisconsin, four persons in contact with a dairy herd developed salmonellosis due to *S. typhimurium*. Two days after 1 cow developed diarrhea and a fever, 4 other cows did also. On the seventh day, a man developed diarrhea, fever, and prostration, and *S. typhimurium* was isolated from his stools. Another man became ill two weeks later and two others were found to harbor the organisms. The 5 sick animals recovered in two weeks.—*Feb. 27, 1959.*

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Trichinosis.—In Maine, all four members of a family who ate sausage, made from locally slaughtered raw pork, developed typical signs and symptoms of trichinosis in a few days. A skin test was positive.—*March 6, 1959.*

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Brucellosis.—The number of cases of human brucellosis in the United States decreased steadily from 4,991 in 1948 to 983 in 1957.—*Oct. 29, 1958.*

The Effect on Egg Size and Production, of Fungicide-Treated and Fumigated Grains Fed to Hens

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TETRAMETHYLTHIURAM disulfide (TMTD), Arasan,* is widely used as a fungicide in the treatment of commercial seed corn. Ethylene dibromide (EDB), Dowfume EB-5,* is widely used to fumigate grains stored in commercial elevators and farm granaries for the control of weevils. The manufacturer of TMTD warns that seeds treated with their product are toxic to poultry, but recommends feeding such seeds when adequately blended with other grains to cattle and hogs.

It is indicated by the manufacturer of the latter product, however, that fumigated grains may be fed to poultry and other species of livestock with no ill effects when the recommended dosage is used and the grains have been adequately aerated.

In 1955, it was reported[3] that feeding corn treated with TMTD to laying hens resulted in the production of soft-shelled and misshapen eggs.[2] The effect produced resembled Newcastle disease, infectious bronchitis, or pullet disease, but all attempts to isolate an infectious agent were unsuccessful. Feed grain treated with this commercial fungicide was shown to be responsible for an egg production problem on at least six farms in Minnesota.[3] Disastrous effects on egg production were still observed, even when such treated grains were heavily diluted with nontreated corn.

In 1955, workers in Israel[2] reported that grains fumigated with EDB, when fed to laying hens as part of their ration, resulted in a gradual diminution in egg size and, in extreme cases, to complete cessation of egg production. A 50 per cent grain ration, using grains containing as little as 10 to 15 p.p.m. of free EDB, for ten to 12 weeks, resulted in a significant diminution in the size but no decrease in the number of eggs laid. The effects were reported to have disappeared after the birds were returned to a normal diet. It was indicated that under farm conditions where grains were kept in open containers, the free EDB would evaporate within two to three weeks, leaving such grains safe for feeding purposes.

During 1957, an egg producer in South Carolina, maintaining flocks totaling up to 10,000 birds, complained of a diminution in egg size and number after feeding oats as part of the laying hens' ration. The oats had been treated with the grain fumigant EDB. The birds laid numerous so-called "pee-wee" (less than 18 oz. per dozen) and small (less than 21 oz. per dozen) eggs. The egg size improved when the fumigated oats were withheld, but did not return to normal.

A milling company at Atlanta, Ga.,[1] has recently advised its customers not to use whole oats fumigated with EDB due to the fact that experimental feeding of such grain to laying hens caused a marked diminution in egg size even when such fumigant was used at the recommended level. No ill effects were detected when fumigated corn was fed and it was believed that a small amount of the toxic EDB was retained in the loose hull of the oats.

FEEDING TRIALS AND RESULTS

In an effort to determine the effect of feeding oats treated with a commercial EDB fumigant on egg size and number, two pens of 12 caged laying hens were set up; those in pen 1 for controls and those in pen 2 for exposure purposes. For the first two weeks, hens in both pens were fed a mash supplement and nontreated oats, free-choice, to determine the normal egg size and number for each group. For the next 23 days, the nontreated oats for the birds in pen 2 were replaced by oats treated with EDB several months previously. While a diminution in egg size occurred, the number remained constant and "pee-wee' eggs did not appear.

During the next 12 days, the birds in the exposed pen were fed oats that had been fumigated the day before with a commercial product containing EDB, using four

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*Arasan is produced by E. I. du Pont de Nemours & Co., Wilmington, Del.; Dowfume EB-5 is produced by Dow Chemical Co., Midland, Mich.

times the dose recommended by the manufacturer. However, instead of a further decline, the egg size tended to return to normal during this period. The fumigant used was the remnant from a 5-gallon can that had been opened about two years previously; therefore, the results of this trial were considered to be of questionable value. Furthermore, the oats and supplement were kept before the birds at all times and they were not compelled to eat the ration before being supplied with additional feed.

The birds in pen 2 were next fed whole oats that had been fumigated with an EDB-containing fumigant from a freshly opened can, using an amount ten times that recommended by the manufacturer, and were compelled to eat all of one day's rations before being provided with additional feed. Before the expiration of this ten-day feeding period, egg number and size began to decline markedly.

During the following two-week period, while being fed normal rations, egg number and size continued to decline. The birds that went out of production laid "pee-wee" eggs when they returned to production. After six weeks of normal feeding, birds in the exposed group were still laying fewer and smaller eggs than were birds in the control group.

SUMMARY AND CONCLUSIONS

Corn containing tetramethylthiuram disulfide (TMTD), known commercially as Arasan, fed to laying hens may have a disastrous effect on egg production even when such grains are heavily diluted with nontreated corn.

Grains fumigated with ethylene dibromide (EDB) fed to laying hens may result in a gradual diminution in egg size and, in extreme cases, a complete cessation of egg production. The effect may take eight weeks or longer to appear.

Oats treated several months previously with a fumigant containing EDB had a depressant effect on egg size but not on egg number during a 23-day feeding period.

The feeding, for ten days, of oats treated with ten times the recommended dose of a fumigant containing EDB, known commercially as Dowfume EB-5, resulted in a marked decline in egg size and number. For two weeks after the birds were returned to a normal ration, most of the eggs laid were either small or "pee-wee' in size. After six weeks on a normal ration, the birds still laid fewer and smaller eggs than did the control birds. Oats fumigated at the recommended level have also been reported to have caused a diminution in egg size when fed to laying hens.

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Round Heart Disease in Chickens

The first cases of "round heart" disease reported in chickens in the United States occurred on two New York State farms—on one in 1949 and on the other in two successive years (1955 and 1956).

One affected flock was divided into two pens, and the birds in one pen were given feed and water from a different source. Mortality in this pen was 10 per cent, compared with 23 per cent in the pen where the feed was unchanged. From the affected flock, 80 apparently healthy birds were moved to laboratory grounds with clean litter and none developed round heart disease.

An attempt to reproduce this disease by keeping normal chickens on litter from the affected pens failed.—*P. P. Levine* in *Avian Dis., 2, (Nov., 1958): 530.*

Parthenogenetic Turkey Sires Young

A male turkey hatched from a nonfertile egg is the sire of 37 healthy poults at the Beltsville, Md., Research Station. This is the first time a known "fatherless" turkey has sired offspring.—*Prairie Farmer (April 4, 1959): 105.*

Source of Histoplasmosis

Why there is a high concentration of *Histoplasma capsulatum* in soil contaminated with bird feces is unknown. The organism has not been cultured from chicken feces. Neither has clinical histoplasmosis been found in pigeons, chickens, or bats even after intravenous inoculation.—*J.Am. M.A. (Feb. 7, 1959): 745.*

Ununited Anconal Processes of the Dog

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"THE FACTS of biology as in any other branch of science make a pattern; they are said to be related. They are also said to explain certain things, the explanations being relatively temporary, and serving to glut the sense of curiosity for a time!"[2]

With this thought in mind, we embark upon a discussion of the elbow lameness of German Shepherd Dogs, which has been described[4] as due to ectopic sesamoid bones. In the past one and a half years, we have seen 11 cases of this type. Another investigator[1] observed that radiographs of 3 German Shepherd pups, 3½ months of age, showed "lines of cleavage" through their anconal processes. The pups he examined were bred from stock of one of the two kennels in which a number of cases have been found, and from the same litter as 1 of our cases. In fact, it is possible that 1 of his dogs was later examined by us.

One worker[3] saw the condition in a German Shepherd Dog, 8 months old, which was presented to him because it had "bowed" elbows. This dog was bilaterally affected. Only one report of such a case is to be found in the literature.[4]

The first cases in this series were discovered as the result of investigation, by radiography, of elbow lameness. Subsequent cases were disclosed by a radiographic survey of the elbows of German Shepherd Dogs presented at the clinic on request or for reasons other than foreleg lameness.

The information gathered in this series would suggest the following probable signs.

HISTORY, SIGNS, AND LESIONS

History.—Intermittent lameness of the foreleg indicated possible pain in the shoulder joint. The severity of the lameness appeared to increase and was particularly pronounced following exercise. The lameness had been noticed in 1 dog at the age of 3½ months, and the oldest affected dog was 3 years of age. The usual age was about 6 months.

Clinical Signs.—Most affected dogs had no marked elevation in temperature on admission, the average rectal temperature being 101.8 F., and the degree of lameness varied. Some would not bear weight on the affected limb when standing still; others showed only slight lameness when made to trot. When forced to trot or run, these dogs showed a disinclination to extend the affected elbow to the expected limit, resulting in a shortened step on the affected leg.

On manipulation, pain seemed to be produced by forced flexion or extension. Crepitus could be produced in some cases during flexion if the olecranon was forced mediad. Distention of the joint capsule with fluctuation was often present. When standing, the affected elbows were deviated outward. One or both elbows were affected.

Radiological Examination.—A lateral view of the elbow with the limb flexed to a right angle produced a satisfactory demonstration of the abnormality. On radiographs, two general shapes of bone fragments have been recognized: a triangular fragment with the base craniad (fig. 1), and a triangular fragment with an elongated posterior attachment which extends over the upper portion of the ulna (fig. 2).

The bone fragment assumes the position occupied by the normal anconal process in the olecranon fossa and is separated from the olecranon by a "line of cleavage" of varying width. The proximal surface of the cleavage line presents a "lipping" as observed in an arthritic joint (fig. 1).

A frequent finding associated with the presence of "ectopic bone" in the elbow joint is an accessory ossification center, medial or lateral to the capitulum of the radius (fig. 3).

In cases of long duration, the anterior aspect of the radius often shows an exostosis at the attachment of the joint capsule, and bursitis with calcific deposit may be evident (fig. 4). The lateral ligaments of the elbow may show ossification.

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The authors acknowledge the help of Dr. H. J. Neely in the reproduction of the photographic material.

Fig. 1—A typical triangular fragment of bone is present in the olecranon fossa of a 1-year-old female dog. "Lipping" (arrow) of the upper end of the cleavage line is obvious.

Fig. 2—Another type of bone fragment is the triangular anconal process with a posterior osseous extension (arrow), in a 10-month-old dog.

TREATMENT

The administration of salicylates or cortisone by any route does not appear to result in an appreciable or lasting remission of lameness. The most satisfactory treatment has been the surgical removal of the bone fragment.

Surgical Technique.—An incision is made posterior to the lateral epicondyle of the humerus, extending from a point 2 inches proximal to the radiohumeral joint distad 4 inches to the lateral surface of the ulna. The anconeus muscle and the joint capsule are incised at the proximal end of the olecranon in order to expose the olecranon. With the leg in extension, the "cleavage line" is evident.

Removal of the small fragment of bone is accomplished by prying it proximad with a periosteal elevator to displace it via the upper end of the olecranon fossa. Once displaced, it will be found that the bone is attached only at its posterodorsal corner to

Fig. 3—Accessory ossification centers are evident at both the medial (A) and lateral (B) aspects of the head of the radius of a 1-year-old female dog.

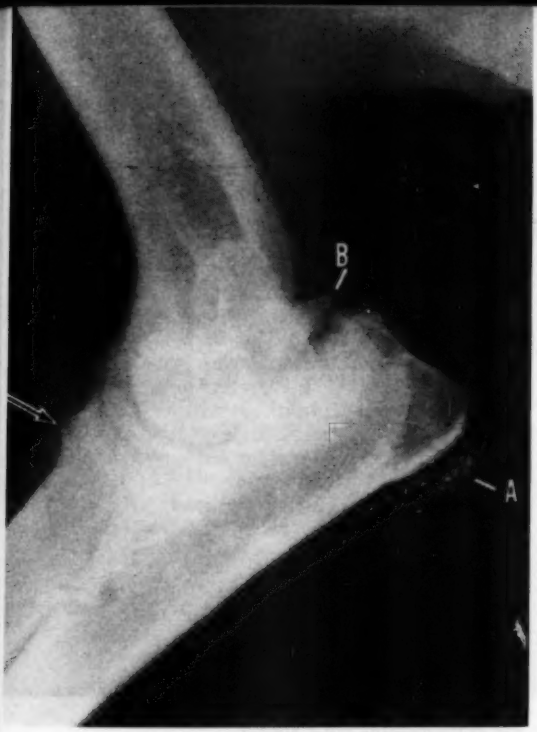

Fig. 4—Bursitis with calcific deposit in the olecranon bursa (A), exostosis of the anterior radial surface (arrow), and ununited anconal process (B) are shown in the leg of this 6-month-old dog.

the joint capsule. This attachment is severed with scissors. The resultant hemorrhage is controlled by a gauze sponge pressed to the site for a short time.

Blood and blood clots are removed from the joint space by irrigation with crystalline penicillin in solution. Cortisone acetate suspension (50 mg.) is instilled into the joint before the incision is closed.

The opening into the joint is closed with simple interrupted sutures of No. 00 chromic catgut by suturing both the capsule and the anconeus muscle simultaneously. The skin is closed with No. 00 silk vertical mattress sutures. The elbow is bandaged snugly for the first five postoperative days, and a suitable antibiotic is administered systemically during that time as a precautionary measure.

Results.—All dogs in this series treated by surgery exhibited no more severe lameness the day after surgery than they had shown before. When lameness was present at the time of surgery, it disappeared in ten days or less.

Pathological Findings.—Exposure of the affected articulation reveals the marked mobility of the offending bone fragment. Invariably, a painful elbow shows erosion of the articular cartilage of the semilunar notch distal to the "cleavage line." Proliferative bone changes are evident on both sides of the cleavage line at its proximal end and on the rim of the articular surface of the lateral condyle of the humerus. The synovial sheath at the origin of the extensor carpi ulnaris muscle is often inflamed and distended with fluid. These changes are probably the result of the mechanical interference to joint movement, caused by the loose bone fragment.

Fig. 5—(Left) The ununited anconal process (arrow) of a 4-month-old pup is evident; (right) five weeks later, the "cleavage line" (arrow) of the same limb has almost completely united.

The bone fragments removed from affected elbows appear to be normal bone both on radiographic and on microscopic examination.

DISCUSSION

This condition of the elbow has been described as ectopic sesamoid bones (patella cubiti).[4] That this is a true description of the lesion is debatable, as patella cubiti as seen in man is rare and constitutes a bone island in the triceps tendon. The condition in dogs does not seem to be rare, and the bone fragment is not in the triceps tendon but on the inner surface of the joint capsule. Moreover, in every instance the bone fragment is the shape and in the position of the anconal process, which is always absent; the joint capsule is attached to the bone fragment along the line where it would normally insert on the anconal process.

It is difficult to state positively what the basic cause of this elbow lameness is. It could be traumatic, but this seems unlikely considering the direction of the cleavage lines in both types of fragments seen in the elbow. It is difficult to conceive of such a fracture occurring except by hyperextension, which is unlikely.

The similarity of the fragments in all cases tends to disprove a traumatic cause on the basis of the improbability of identical fractures occurring. If such a fracture did occur, it would have been at a time when the anconal process was still cartilaginous in some cases, as these dogs had cartilage on both sides of the cleavage line and no signs of union, fibrous or otherwise. Some union would be expected had the ossified anconal process been fractured. In a few cases, fibrous union did occur, with fibrocartilage on both sides of the cleavage line, and these could conceivably have been fractured after ossification.

None of the dogs had become lame suddenly, and the severity of lameness was never most acute at the onset, facts which would tend to preclude a traumatic origin.

Of the 11 affected dogs seen by us, all were related in some degree and 9 were in two breeding kennels. The pedigrees of 2 dogs could not be traced. Of the 9 related dogs, 4 were from one litter, 2 were from another, and 3 were of the preceding generation. Thirty-five per cent of affected dogs had bilateral involvement of the elbows. Two dogs, from a litter which had 4 cases, had bilateral "cleavage lines" of minimal width at 4 months of age. Both showed almost complete union of the anconal process to the olecranon five weeks later (fig. 5). The 3 cases described in the literature were a German Shepherd Dog bitch and 2 of her offspring from different litters.[4]

In the light of the foregoing, it is highly probable that this type of lameness in the German Shepherd Dog is caused by the loose fragment of bone in the posterior portion of the elbow joint. Moreover, the evidence seems conclusive that this fragment of bone is the anconal process which is unnited to the olecranon.

Normally, the ulna of the dog arises from three ossification centers: the distal, diaphyseal, and olecranon. The fact that some of the ununited anconal processes encountered eventually fused with the olecranon processes would suggest the possibility of a fourth, anconal, center of ossification.

That this is not improbable is supported by the presence of accessory centers of ossification at the head of the radius in a number of the cases seen. The presence of the fourth ulnar ossification center would seem likely to be hereditary in view of the high proportion of bilaterally symmetrical elbow involvement, the close relationship of the affected dogs, and finally the apparently high proportion of involvement within the kennels and the litters. It is known that normally occurring ossification centers may, on occasion, fail to unite with the adjacent bone because of trauma or for unknown reasons. It would seem reasonable to assume, therefore, that abnormally occurring ossification centers are likely to remain ununited in a high proportion of instances.

We believe that this condition is not uncommon in the German Shepherd Dog and that many foreleg lamenesses can be explained on the basis of this defect. It is suggested that it be designated as an "ununited anconal process" of hereditary origin.

SUMMARY

Eleven cases have been described wherein a triangular fragment of bone appeared in the olecranon fossa of German Shepherd Dogs.

The clinical signs of abnormality varied but, in general, there was marked evidence

of lameness, a shortened step on the affected leg, and some pain seemed to be produced by manipulation of the affected elbow. In some instances, crepitus could be felt. Distention of the joint capsule was a frequent finding. Positive diagnosis was achieved by radiography.

Surgical removal of the ectopic bone fragment is the only satisfactory therapeutic measure. The cause of the condition is unknown, but clinical evidence is strongly suggestive that the bone fragment is the anconal process which remains ununited to the olecranon.

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Torsion of the Left Lateral and Papillary Lobes of the Liver in a Pup —A Case Report

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On Nov. 24, 1958, a female Bassett Hound, 4½ months old, was examined prior to ovariohysterectomy and was found to be normal, healthy, and lively.

That afternoon, the routine operation was performed. Preanesthetics were used and sodium pentobarbital was given intravenously to effect. During surgery, the dog strained slightly but for only a few moments.

She sat up that evening and seemed to be recovering normally from the anesthetic, but the following morning she had a body temperature of 96.5 F. and seemed pale. It was believed that one of the ovarian ligatures must have slipped, or that her blood had poor clotting power, so 200 cc. of whole blood was given intravenously. The color improved, but three hours later, the mucous membranes were again ischemic and another 300 cc. of whole blood was given.

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Because the patient was too weak for the surgery required to locate a possible slipped ligature and replace it, a pressure bandage was applied around the abdomen. As this was being accomplished, the mucous membranes blanched again as if the pressure had dislodged a clot, allowing further hemorrhage. The patient went into acute shock and was hardly breathing when more blood was administered. She rallied and sat up, and within one hour the mucous membranes had become slightly pink.

The following morning, the pup walked about, wagged her tail, and drank a little milk. On postoperative (p.o.) day 4, her body temperature was 100.2 F., but she was icteric and vomited after drinking water. This was attributed to hemolysis of intraperitoneal blood and pressure from the bandage. The bandage was slit down the back, but allowed to remain on the body.

On p.o. day 5, she vomited many ascarides and had a profuse diarrhea with many ascarides in the feces. Ringer's solution (500 cc.) was administered subcutaneously to combat chloride loss. Late on p.o. day 6, the patient walked about restlessly, and diarrhea and vomiting persisted. It seemed unusual for vomiting to persist and for appetite not to return, but it was thought that massive blood clots around the intestines could be the cause. Early on p.o. day 7, the patient died.

Necropsy revealed the left lateral lobe of the liver to be necrotic and gangrenous; the papillary lobe, pale and necrotic. There was a small amount of serosanguineous fluid in the abdominal cavity. The other lobes of the liver were somewhat congested, but otherwise normal. Manipulation of the necrotic lobes revealed that they had made a complete 360-degree turn around the axis of their attachment to the rest of the liver and the diaphragm. The resulting congestion of liver tissue, the disturbance of circulation, and the interference with liver function all accounted for the clinical signs.

CONCLUSION

We believed it worthwhile to call attention to this most unusual complication of an apparently routine ovariohysterectomy. It is presumed that the left lateral ligament of the liver was congenitally absent, allowing the lobes to rotate during or after surgery. The deep-chested conformation of the animal was perhaps a contributing factor.

The Narcotic Analgesics and Their Antagonists as Adjuncts to Barbiturate Anesthesia. II. Clinical Applications

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A PREVIOUS REPORT[1] was concerned with the pharmacology of the narcotic analgesics and levallorphan (Lorfan Tartrate*) and nalorphine (Nalline Hydrochloride*). The purpose of this paper is to indicate the practical applications of the antagonism that exists between the narcotic analgesics and the N-allyl derivatives of morphine and levorphanol (Levodromoran Tartrate*).

MATERIALS AND METHODS

The materials and methods used were those that were described previously.[1] In this study, however, morphine and meperidine (Demerol**) were employed as preanesthetic agents and blood pressure was taken from the carotid artery. Pentobarbital sodium was used in all cases as the general anesthetic.

Twenty of the experiments were performed during the course of laparotomy for another investigation, and the conditions were entirely compatible with those encountered in surgery.

PROCEDURE AND RESULTS

Thirteen dogs were used as their own controls. They were anesthetized to plane 2 surgical anesthesia and the amount of pentobarbital sodium required was recorded. Several days later, the dogs were given meperidine preanesthetically in doses of 7.5 or 10.0 mg. per pound of body weight and then anesthetized to plane 2 surgical anesthesia. The amount of pentobarbital sodium required for anesthesia was reduced by 22.6 per cent when meperidine was administered in doses of 7.5 mg./lb., and the reduction in pentobarbital sodium was 38.1 per cent when the meperidine dosage was 10 mg./lb. (table 1). The latter difference was statistically significant below the 0.1 per cent level.

The same dogs were used in a similar procedure employing morphine as the preanesthetic agent. Morphine in doses of 1 mg./lb. preanesthetically was accompanied by a 30.6 per cent reduction in the amount of pentobarbital sodium required for plane 2 anesthesia; and in doses of 2 mg./lb., it was followed by a 42.2 per cent reduction (table 2). These differences were statistically significant below the 0.1 per cent level.

Ten dogs were treated preanesthetically with morphine in doses of 2 mg./lb. and anesthetized with pentobarbital sodium to plane 2 surgical anesthesia. Following laparotomy and during closure of the abdominal incision, measurements were made of various parameters of respiratory and cardiac function. Levallorphan was administered intravenously and the measurements repeated. The data (table 3) show that following the injection of levallorphan, respiratory rate, tidal volume, and minute volume increased significantly.

Simultaneously, significant decreases occurred in ventilatory equivalent and arterial CO_2 content. The increase in oxygen consumption and decrease in arteriovenous oxygen differences are of questionable significance. Cardiac output varied erratically and the "averages" listed in table 3 do not represent the average of a consistent trend.

Ten dogs were treated preanesthetically with the intramuscular administration of meperidine, 10 mg./lb., and anesthetized to plane 2 surgical anesthesia. The procedure followed was the same as that described above for morphine, and the data are summarized (table 4). Statistically significant increases in rate, tidal volume, and minute volume of respiration followed the administration of levallorphan, and the decrease in the ventilatory equivalent was also significant.

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This material was taken in part from a thesis presented by Dr. Aronson to the faculty of the Graduate School, Cornell University, in partial fulfillment of the requirements for the degree of Master of Science in pharmacology.

*Lorfan Tartrate and Levodromoran Tartrate are produced by Hoffmann-LaRoche, Inc., Nutley, N.J.; Nalline Hydrochloride by Merck Sharp and Dohme, Philadelphia, Pa.

**Demerol Hydrochloride is produced by Winthrop Labs., Inc., New York, N.Y.

TABLE 1—Effect of Meperidine in Reducing the Amount of Pentobarbital Required for Anesthesia

	Pentobarbital alone					Meperidine preanesthetically, 7.5 mg./lb.					
Dog No.	Weight (lb.)	Weight (kg.)	Total anesthetic (mg.)	Dose (mg./lb.)	Dose (mg./kg.)	Weight (lb.)	Weight (kg.)	Total anesthetic (mg.)	Dose (mg./lb.)	Dose (mg./kg.)	Decrease in pentobarbital (%)
164	28.0	12.7	410	14.6	32.2	28.0	12.7	325	11.6	25.6	20.7
165	37.0	16.8	650	17.6	38.7	38.0	17.3	455	12.0	26.3	30.0
166	30.0	13.6	494	16.5	36.4	20.5	13.9	358	11.7	25.8	27.5
169	25.5	11.6	390	15.3	33.6	26.5	12.1	293	11.1	24.2	24.9
171	24.0	10.9	325	13.6	29.8	24.0	10.9	325	13.5	29.8	0.0
	Averages		454	15.5	34.1			351	12.0	26.3	22.6
	Pentobarbital alone					Meperidine preanesthetically, 10 mg./lb.					
161	35.5	16.2	468	13.2	28.9	36.0	16.4	292	8.1	17.8	37.6
162	25.0	11.4	358	14.3	31.4	24.5	11.2	208	8.5	18.6	41.9
163	24.0	10.9	351	14.6	32.2	23.5	10.7	247	10.5	23.1	29.6
167	24.0	10.9	390	16.2	35.8	24.5	11.2	254	14.4	31.6	34.9
168	25.0	11.4	377	15.1	33.1	25.5	11.6	234	9.2	20.2	37.9
170	17.0	7.7	260	15.3	33.7	17.5	8.0	156	9.9	19.5	40.0
172	24.0	10.9	364	15.2	33.4	23.5	10.7	234	10.0	21.9	35.7
173	39.0	17.7	585	15.0	33.0	37.0	16.8	325	8.8	19.4	44.4
	Averages		394	14.9	32.7			244	9.8	21.5	38.1

The decrease in arterial CO_2 was of questionable significance. It should be pointed out, however, that arterial CO_2 was considerably lower in the meperidine series than in the morphine series. In addition, minute volume was far less depressed in the dogs pretreated with meperidine than in those receiving morphine. Because cardiac output studies were done in only 4 dogs, the changes that occurred cannot be evaluated.

The administration of levallorphan was followed by a greater ventilatory effort in the morphine series, because pretreatment with morphine was associated with a greater degree of hypoventilation and CO_2 retention. The similarity in minute volume attained following levallorphan administration in both the morphine and meperidine series is of interest (tables 3, 4). The doses of levallorphan used were those recommended for man (table 5).[14]

In a series of experiments in this laboratory, it was found that the amount of levallorphan and nalorphine could be reduced to 25 per cent of this recommended dose and still produce a satisfactory respiratory response when respiration was depressed by morphine. The antagonism of meperidine depression was also evident at low doses; however, it was found that a reliable response was obtained with 50 per cent of the recommended dose.

Depression of cardiovascular function was not prominent. Average carotid artery blood pressure in the morphine group was 118/85 mm. Hg., and in the meperidine series 130/110 mm. Hg. A rise of 20 to 25 mm. Hg. in the diastolic pressure, and a rise of 10 mm. Hg. in the systolic pressure,

TABLE 2—Effect of Morphine in Reducing the Amount of Pentobarbital Required for Anesthesia

	Pentobarbital alone					Morphine preanesthetically, 1 mg./lb.					
Dog No.	Weight (lb.)	Weight (kg.)	Total anesthetic (mg.)	Dose (mg./lb.)	Dose (mg./kg.)	Weight (lb.)	Weight (kg.)	Total anesthetic (mg.)	Dose (mg./lb.)	Dose (mg./kg.)	Decrease in pentobarbital (%)
163	24.0	10.9	351	14.6	32.2	23.5	10.7	260	11.1	24.3	25.9
165	37.0	16.8	650	17.6	38.7	37.0	16.8	403	10.9	24.0	38.0
167	24.0	10.9	390	16.2	35.8	23.5	10.7	234	10.0	21.9	40.0
168	25.0	11.4	377	15.1	33.1	25.5	11.6	260	10.6	23.2	31.0
171	24.0	10.9	325	13.6	29.8	23.0	10.5	260	11.3	24.8	20.0
173	39.0	17.7	585	15.0	33.0	37.5	17.0	442	11.8	26.0	24.4
	Average		446	15.4	33.8			310	11.0	24.0	30.6
	Pentobarbital alone					Morphine preanesthetically, 2 mg./lb.					
161	35.5	16.2	468	13.2	28.9	36.0	16.4	280	7.8	17.1	40.2
162	25.0	11.4	358	14.3	31.4	25.0	11.4	195	7.8	17.1	45.5
164	26.0	12.7	410	14.6	32.2	28.5	13.0	260	9.1	20.0	36.6
166	30.0	13.6	494	16.5	36.4	29.0	13.2	286	9.9	21.7	42.1
169	25.5	11.6	390	15.3	33.6	25.5	11.6	260	10.2	22.4	33.3
170	17.0	7.7	260	15.3	33.7	17.0	7.7	137	8.1	17.8	47.3
172	24.0	10.9	364	15.2	33.4	23.5	10.7	169	7.2	15.8	53.6
	Average		392	14.9	32.8			227	8.6	18.8	42.2

TABLE 3—Effect of Levallorphan Administered to an Anesthetized Dog Given Morphine Preanesthetically

	Pre-levallorphan values (6-min. av.)	Post-levallorphan values (6-min. av.)	Standard error	p (t)
Respiratory rate*	5.90	11.70	± 1.02	<0.001
Tidal volume (cc.)*	114.00	142.00	± 4.35	<0.001
Minute volume (cc.)*	541.00	1,508.00	± 132.9	<0.001
Oxygen consumption (cc./min.)*	64.20	66.00	± 0.78	<0.05
Ventilatory equivalent*	0.1606	0.0489	± 0.0286	<0.001
Arterial CO_2 (vol. %)**	56.30	51.20	± 0.74	<0.001
Arterial-venous oxygen difference (vol. %)†	3.90	2.70	± 0.43	<0.05
Cardiac output (liters/min.)†	2.30	3.31	± 0.53	>0.10

*Ten animals; ** 9 animals; † 7 animals.

followed the administration of levallorphan. Changes in heart rate were not significant.

DISCUSSION

The rationale for preanesthetic medication with the narcotic analgesics has been debated inconclusively by anesthesiologists and veterinarians. The difficulty in evaluating the literature lies primarily within the strange biological realm known as "species differences."

Morphine serves as an excellent example. Considerable data have been amassed indicating the disadvantages, and indeed the hazards, associated with the use of morphine in man.[2] Of great importance are derangements in vasomotor responses,[3] often associated with the insidious onset of irreversibility. The responses to levallorphan and nalorphine have been salutary, but the evidence is not conclusive that any measure of vasomotor reactivity returned.[5]

Respiratory depression per se no longer poses a serious threat to life. Artificial respiration under the guidance of a trained anesthetist adequately restores satisfactory ventilation. However, hypoventilation following preanesthetic administration of morphine has been shown to impede the onset of inhalation anesthesia.[15] It also has been demonstrated that the preanesthetic administration of morphine increases the anesthetist's difficulty in determining the stages of pentothal sodium anesthesia.[7]

Finally, doubt has been expressed that a 15-mg. dose of morphine to a 150-lb. man would reduce the total amount of the general anesthetic needed to maintain anesthesia.[2]

TABLE 4—Effect of Levallorphan Administered to an Anesthetized Dog Given Meperidine Preanesthetically

	Pre-levallorphan values (6-min. av.)	Post-levallorphan values (6-min. av.)	Standard error	p (t)
Respiratory rate*	8.40	10.90	± 0.36	<0.001
Tidal volume (cc.)*	116.00	134.00	± 2.52	<0.001
Minute volume (cc.)*	927.00	1,427.00	± 58.63	<0.001
Oxygen consumption (cc./min.)*	66.90	68.10	± 0.75	>0.10
Ventilatory equivalent*	0.0712	0.0477	± 0.0045	<0.001
Arterial CO_2 (vol. %)**	49.20	47.40	± 0.87	<0.05
Arterial-venous oxygen difference (vol. %)†	4.30	3.90	± 0.28	>0.10
Cardiac output (liters/min.)†	1.23	1.50	± 0.32	>0.05

*Ten animals; ** 7 animals; † 4 animals.

The dog reacts to morphine much the same as does man, but some important differences have been observed. Neural regulation of respiration in the dog does not exhibit the same degree of disorientation under the influence of morphine that is seen in man. The respiratory patterns following the administration of morphine to the dog, either preanesthetically or intravenously during anesthesia, do not show the periodicity and "ataxic" quality of respiration which characterize the human response.[9,12]

TABLE 5—Recommended Doses of Levallorphan for Man

Narcotic	Narcotic: Nalorphine	Narcotic: Levallorphan
Morphine	10:1	50:1
Meperidine	20:1	100:1

Circulatory responses to morphine are much the same in the two species.[3,5] However, the administration of the antagonists to the dog under the influence of morphine was followed by a moderate but significant increase in blood pressure. The improvement in circulatory function may have been a reflection of enhanced respiration, e.g., decrease in arterial CO_2 and an increased venous return. The evidence also strongly suggests a return of vasomotor reactivity. Since the increase in diastolic pressure largely accounted for the rise in blood pressure, the pressor response was the result of increased peripheral resistance.

The substitution of meperidine for morphine as the preanesthetic agent resulted in some noticeable modifications in respiratory function, paralleling the response of man to meperidine.[13] Ventilation did not decrease to the same extent as in the morphinized dogs, and arterial CO_2 was much lower in the meperidine group. Consequently, the administration of levallorphan was associated with much smaller percentage increases in respiratory functions. Blood pressure changes following levallorphan administration were of the same order as those in the morphine series.

The administration of 2 mg./lb. of morphine preanesthetically was associated with a 42.2 per cent decrease in the amount of pentobarbital sodium required to attain plane 2 surgical anesthesia. This dose of morphine is less than 50 per cent of that recommended for preanesthetic medication.[10] The dogs were deeply sedated and anesthetic induction was accomplished without any signs of the delirium and excitement characteristic of stage 2.

It was essential that pentobarbital sodium be administered slowly in order to take full advantage of the additive effects of the opiate and barbiturate. This procedure was feasible since the deep sedation induced by morphine obviated the appearance of stage 2 excitement. Meperdine, 10 mg./lb. administered preanesthetically, provided the same advantages, although the degree of sedation was not as profound as in the morphinized dogs.

The narcotic antagonists provide the veterinarian with a means for eliminating respiratory and circulatory depression without resorting to artificial respiration or to the use of analeptic therapy with all of its disadvantages.[4] It has been clearly demonstrated that when the narcotic analgesics are employed as adjuncts to anesthesia, the administration of levallorphan or nalorphine permits the resumption of adequate respiration without altering the level of anesthesia. Furthermore, the narcotic analgesics may be administered during the course of prolonged surgery as supplemental anesthesia, respiratory depression being prevented or overcome by the use of levallorphan or nalorphine.[6]

It has been the experience in this laboratory that when levallorphan or nalorphine has been administered, subsequent use of meperidine will maintain anesthesia without any serious reduction in ventilation. Morphine administration under these conditions is not associated wth a decrease in minute volume, but arterial CO_2 increases. Therefore, morphine is not recommended to supplement prolonged anesthesia.

The following schedules have been devised and found practical for the use of the narcotic antagonists during anesthesia:

1) Analgesic preanesthetically—barbiturate to desired plane of anesthesia—antagonist administered immediately upon conclusion of barbiturate administration.

2) Analgesic preanesthetically—barbiturate to desired plane of anesthesia—antagonist if hypoventilation develops.

3) Analgesic preanesthetically—barbiturate to desired plane of anesthesia—antagonist given periodically during surgery and recovery period.

4) Analgesic preanesthetically—barbiturate to plane 1 anesthesia—analgesic to plane 2—antagonist when needed to insure adequate ventilation.

Preliminary investigations indicate that alphaprodine (Nisentil Hydrochloride†) in combination with levallorphan may be the analgesic of choice for procedure 4. In conjunction with levallorphan it has been used successfully to supplement nitrous oxide-pentothal sodium anesthesia in man.[6] However, the data relative to pentobarbital sodium anesthesia in the dog are incomplete and a further report will be made.

The doses of levallorphan and nalorphine recommended for man (table 5) have been found satisfactory for administration to the dog. When the antagonists are to be repeated at frequent intervals, *i.e.*, every 30 to 45 minutes, the dose should be reduced

†Nisentil Hydrochloride is produced by Hoffmann-LaRoche, Inc., Nutley, N.J.

to 50 per cent of the total dose at each injection. Levallorphan and nalorphine are depressant drugs in themselves and it is recommended that the total amount given in a four-hour period not exceed 5 mg. of levallorphan or 25 mg. of nalorphine for dogs averaging 25 to 35 lb. The dose of levallorphan or nalorphine should be approximately 1/15 to 1/20 of the adult dose for treating neonatal respiratory depression caused by the narcotic analgesics.

Although these reports have been concerned with the use of the narcotic analgesics and their antagonists in general anesthesia, it should be obvious that the same principles may be applied to local anesthesia. Reasonably extensive surgery may be performed under deep morphine or meperidine sedation and the patient aroused and returned to a relatively normal state within two minutes after the administration of one of the antagonists. In the small animal clinic at Cornell University, meperidine hypnosis, followed by nalorphine therapy, has been used as the sole central nervous depressant for several cesarian sections.[11]

The narcotic antagonists should have wide application in veterinary medicine and surgery. However, the techniques described here are not recommended as a panacea for every anesthetic situation, nor should it be assumed that the need for careful postoperative management is thereby eliminated. The clinician must adapt his anesthetic procedures to the requirements of the patient and to the type of surgery to be performed.

SUMMARY

The preanesthetic administration of morphine or meperidine (Demerol) in suitable doses significantly reduced the amount of pentobarbital sodium required to attain plane 2 surgical anesthesia.

Hypoventilation and circulatory depression were overcome by the use of the narcotic antagonists without altering the plane of anesthesia. One milligram of nalorphine is recommended for every 10 mg. of morphine or 20 mg. of meperidine used preanesthetically. One milligram of levallorphan is recommended for every 50 mg. of morphine or 100 mg. of meperidine.

The antagonist may be administered immediately after the induction of anesthesia, when signs of hypoventilation appear, or in fractional doses during surgery and the recovery period.

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Clinical Data

Promazine Hydrochloride in Equine Practice

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PROMAZINE hydrochloride (Sparine)* was first used on a limited experimental basis at the large animal clinic of the New York State Veterinary College in the fall of 1957. Subsequently, it has been used regularly. This is a report of clinical results and impressions on the value of this drug in equine veterinary practice.

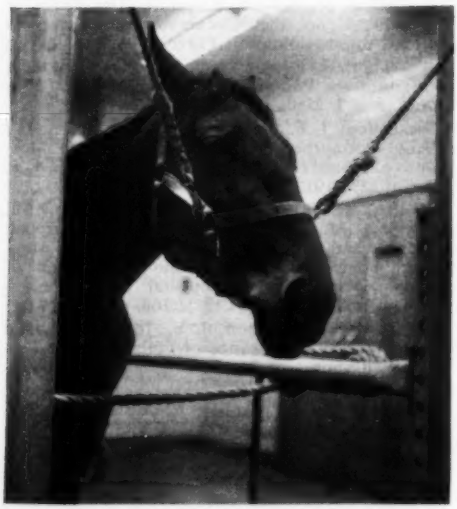

Fig. 1—Expression of horse tranquilized with 300 mg. of promazine hydrochloride. Notice the slightly drooping ears, eyelids, and lower lip.

Many horses which must be dealt with are undisciplined and frightened, others are belligerent. In fact, a significant number of horses is referred to the clinic because they are uncooperative patients. In many instances, promazine hydrochloride has been satisfactory in either eliminating or at least lessening the need for pure physical restraints and hypnotics and sedatives.

In most cases, the drug was injected into the jugular vein, using a sterile 2-inch, 20-gauge needle and a 10-cc. glass syringe. The intramuscular route was unsatisfactory because larger doses and a longer time interval were required for effect.

CASE STUDIES

Of 100 equine patients given promazine hydrochloride during this study, 45 were restrained in a recumbent position for surgical procedures which included: neurectomy, repulsion of tooth, hernia repair, wound treatment, cunean tendinectomy, supraspinous bursectomy, ovariectomy, and eye surgery. The horses weighed 950 to 1,400 lb., most of them about 1,050 lb. There were also 1 pony and 1 small yearling. In this group of 45, 3 horses were given 200 mg. of promazine hydrochloride intramuscularly and 42 were given 100 to 300 mg. intravenously. Of the 42, 16 were given 250 mg. and 7 were given 200 mg. each. The drug was given 15 to 20 minutes before the animals were restrained when Equitol,** or local anesthetic, or both were used for sedation and anesthesia. The tranquilization in this group was very good in 2 horses; good in 33; fair in 7; and poor in 3.

Another 55 horses were left in a standing position for examinations, treatments, and surgical procedures which included: castration, tendinotomy, neurectomy, roaring operation, enucleation of eye, "firing," teeth examination, and rectal examination. Promazine hydrochloride was given because the animal had demonstrated that it was likely to become fractious or, in a few instances, to insure a smooth operation. In this group of 55, there were 3 ponies which were given 75 to 120 mg. and 52 horses which were given 150 to 600 mg. of the drug. Most of these doses (44) fell into a range of 200 to 300 mg. Local anesthesia was used for those surgical procedures which would have been painful. The tranquilization was very good in 16 patients; good in 21; fair in 13; and poor in 5.

The following case reports are typical examples of good promazine hydrochloride tranquilization.

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*Sparine was furnished by Wyeth Laboratories, Inc., Philadelphia, Pa.

**Equitol (chloral hydrate 21.3 Gm.; pentobarbital 4.8 Gm.; magnesium sulfate 10.6 Gm.; alcohol 9.5%; in an aqueous propylene glycol base) is a product of Pitman-Moore Co., Indianapolis, Ind.

Case 1.—An aged gelding with a diseased penis was given 250 mg. of the drug intravenously. In 15 minutes, the penis was extended and the gross appearance was that of an ulcerative carcinoma. The tranquilization allowed examination of the neoplasm without the need of painful traction on the penis.

Case 2.—A Standardbred mare with a persistent furunculosis of the hind pastern had been at stall rest for several weeks and acted highly excitable. Roentgen therapy was indicated but a problem of motion of the part was anticipated. An attempt was made to give the barbiturate-chloral hydrate solution intravenously preparatory to placing her on the table. However, since the mare persisted in rearing, making a prolonged intravenous administration hazardous, 250 mg. was easily given in the vein. In 20 minutes, the mare was completely cooperative and did not move during therapy.

Case 3.—An excitable 2-year-old Standardbred stallion was to be operated on for spavin, extraction of wolf teeth, and castration. When given 200 mg. of promazine hydrochloride, his attitude changed from spirited resistance to relative serenity. The castration and cunean tenotomy were carried out, under local anesthesia, on the standing animal with no resistance. The wolf teeth were removed with a minimum of disturbance.

Case 4.—A gelded Welsh pony refused to walk up a loading ramp to the truck. Half an hour was wasted in applying ropes, pulling, pushing, and encouraging with oats, during which time the pony accidentally lacerated a lip. Within ten minutes after it was given 150 mg. of the drug intravenously, the pony quietly walked up the ramp on the first attempt.

Many other cases similar to the above might be cited. In a few instances, the administration of promazine hydrochloride was not followed by such desirable results. The following cases are examples.

Case 5.—A large gelded hunter refused to submit to an oral examination even after 500 mg. of the drug was injected intramuscularly. The next day, a few minutes after he was given 500 mg. intravenously in an attempt to restrain him on the operating table, he lay down. After lying quietly for a short time, he got up and was then restrained on the operating table. The examination was carried out and, upon release from the table, he again lay down. He was allowed to rest quietly for 20 minutes, after which he got up when stimulated manually. The horse showed no ataxia in arising or in walking to his stall. This cumulative effect, of successive doses of promazine hydrochloride given within 24 hours, has been observed to a lesser degree in other instances.

Case 6.—In a Thoroughbred gelding requiring daily irrigation of the maxillary sinus, the results were consistently poor. This horse was given promazine hydrochloride on three different occasions. The doses were 300 mg. intramuscularly and 350 and 500 mg. intravenously. This made the necessary manipulations somewhat easier, but anxiety, fear, and violent resistance were always present. This was attributed to the fact that this horse suffered pain over a long period and had become hopelessly head-shy. The pain originated from extension of infection from a diseased tooth to the infraorbital nerve.

Case 7.—A Standardbred colt, 6 months old, exhibiting signs of neuritis of the facial nerve was incapable of prehension and swallowing. Supportive treatment necessitating passage of the stomach tube and intravenous therapy was made difficult by the rearing and lunging of the colt. An intramuscular injection of 200 mg. of promazine hydrochloride had no tranquilizing effect on this colt. The following day, this dose was repeated with only fair results. The colt died six days after the onset of illness. Necropsy revealed a nonsuppurative encephalitis. The possibility of rabies in this colt was not ruled out.

Case 8.—A dangerous reaction to promazine hydrochloride occurred several months after the series of 100 equine patients had been studied. A Standardbred pacing gelding was to be tranquilized preparatory to local infiltration of procaine hydrochloride and firing. Promazine hydrochloride (300 mg.) was given intravenously and, before the needle could be withdrawn, the horse reared up and threw a front leg over the cross ties. These ropes were cut. The horse fell in right lateral recumbency and "paddled" violently for five to six minutes until 60 cc. of the barbiturate-chloral hydrate solution was given intravenously. This treatment ended the violent motions of the limbs but the pulse continued at the high rate of 120.

The animal was not ready to rise for 15 minutes, during which time he salivated ex-

cessively. When finally helped to his feet, the horse was severely ataxic but completely tranquil. The recovery from this reaction was complete in 48 hours. Three weeks later, intravenous injections of 25 mg. and then 50 mg. of promazine hydrochloride produced no adverse reaction. It was estimated that about 200 injections of promazine hydrochloride had been given to horses before this first and only untoward reaction.

DISCUSSION

Promazine hydrochloride has many advantages over other means of restraint when applied to horses. The relatively small volume of a dose (1 to 10 cc.) makes an intravenous injection easy through a small-gauge needle. Within five to ten minutes, the facial expression of the horse (fig. 1) will indicate whether the desired effect is to be gained. The tranquilized horse develops an "expressionless" attitude with slightly drooping ears, eyelids, and lower lip. The full effect of a dose is evidenced within the first hour. A diminishing effect seems to last for several hours. Occasionally, some residual effect may be noticed 24 hours later; therefore, if a second dose is to be given, it should be decreased.

In major surgery, following use of promazine hydrochloride, the barbiturate-chloral hydrate dose may be reduced. This facilitates a smooth recovery from anesthesia and a rapid return to full feed intake. In many instances, promazine hydrochloride has enabled us to do an operation on the standing patient whereas in the past such operations were routinely done on the operating table. For example, in this series, cases of radical stringhalt operation, trephining of the frontal sinus, and the removal of a sarcoid from the ventral midline were carried out with horses standing in stocks. In operations which have always been done on standing patients, the tranquilizer has been valuable by eliminating much of the anxiety, fright, and disturbing movements during the induction of local anesthesia and the surgery itself. In painless procedures, the stocks and promazine hydrochloride are the only restraint methods used. Occasionally, when horses are not completely tranquilized due to insufficient dosage, the nose twitch on selected animals works very nicely. One of the outstanding features of this tranquilized state is the relaxation and dropping of the penis from the sheath in geldings and stallions. The effect greatly facilitates complete examination of the penis as well as indicating the depth of tranquilization.

With the exception of the one adverse reaction (case 8), there are only minor disadvantages to the use of promazine hydrochloride in the horse. These are an occasional disruption of tranquillity due to a strange sound or sensation and the tendency for a completely restrained horse, in spite of the drug, to continue struggling, although to a lesser degree. Certain individuals appear to be somewhat refractory to promazine hydrochloride regardless of sex. The one adverse reaction experienced is considered an idiosyncrasy of this particular horse. The remaining contents of the vial which produced the reaction (200 mg.) were innocuous to another horse. The subsequent doses of promazine hydrochloride given to the horse in case 8 totalled 75 mg. and resulted in complete tranquilization. It is believed that the horse had a low tolerance to this drug.

SUMMARY

The clinical results and observations on 100 equine animals which were chemically restrained with promazine hydrochloride (Sparine) are reported. The results were very good in 18 patients, good in 54, fair in 20, and poor in 8; thus 72 per cent were satisfactory.

Reasons are suggested for the poor results in some cases; sex was not a factor.

It is recommended that the dosage be determined on an individual basis after considering the size and temperament of the animal, the type of operation to be done, and the amount of the drug the animal had recently been given.

A reasonable dose for a 1,000-lb. horse is 250 mg. (200-300 mg.) given intravenously.

Immunity Studies in Dourine

Mares experimentally infected with *Trypanosoma equiperdum*, in Yugoslavia, were then resistant for nearly nine months to reinfection with this equine venereal disease (long since eradicated from the U.S.). Specific antibody could not be demonstrated during the period of immunity. Trypanosomes do not contain endotoxins but are believed to produce toxins during reproduction.—*Vet. Bull. (Jan., 1959): Item 55.*

Fatal Occlusive Pulmonary Embolism in the Dog— A Case Report

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THE PURPOSE of this paper is to report the occurrence, in a dog, of occlusive pulmonary embolism that clinically resembled congestive heart failure. Naturally occurring stenosing lesions in the pulmonary arteries of the dog are uncommon.

One writer[4] reported the presence of massive-sized emboli in the pulmonary arteries of a dog, which he believed resulted from recurrent embolism. These emboli arose from a right-sided ulcerative mural endocarditis due to the presence of *Dirofilaria immitis*. Fatal occlusive pulmonary embolism has been produced experimentally in dogs by the injection of fibrin and various inorganic substances into the iliofemoral veins.[1,3]

In man, pulmonary embolism is common and occurs most often in connection with pelvic and abdominal surgery and venous thrombosis of the lower limbs.[2]

CASE REPORT

A nonspayed, female hound, 7 years old, was brought to our clinic. Two days previously, she had become weak, staggered, and then collapsed. After a short time she got up, but showed signs of general weakness since that date.

Upon examination, the dog was found to be extremely weak, dyspnea was marked, the mucous membranes were pale, and there was slight edema along the cranioventral thoracic wall. The body temperature was 101.4 F. Auscultation revealed a systolic murmur over the left side of the heart at the fourth intercostal space.

A provisional diagnosis of cardiac insufficiency was made and the patient was given digitalis therapy. The condition became progressively worse and there was a definite increase in the amplitude of the murmur. The dog died two days following admission to the clinic.

Gross Pathological Findings.—The buccal mucosa was markedly cyanotic. The pulmonary conus, right and left pulmonary arteries, coronary veins, right atrium, and right ventricle were greatly dilated. A laminated thrombus completely occluded the pulmonary arteries from a point 1 cm. from the semilunar valve and extending through the right and left branches of the pulmonary artery. The lungs were congested, and consolidated areas of varying size occupied the most cranial dependent portions. There was no gangrenous infarction.

The tricuspid valve cusps were slightly thickened and three small verrucae (2-3 mm.) were found along their free edges. The cusps of the mitral valve were also thickened and had two small verrucae. The liver was congested, dark red, and somewhat swollen. There was a marked chronic interstitial nephritis. An examination of the large venous vessels in the limbs failed to reveal any thrombotic masses.

Histopathological Findings. — Sections prepared from occluded portions of the pulmonary artery revealed no degenerative changes in the vessel wall. Many of the smaller pulmonary arteries contained thrombo-embolic deposits. The pneumonic areas were not the acute hemorrhagic type but more subchronic in nature, as evidenced by the infiltration of many mononuclear phagocytes and lymphocytes and by early organization of the necrotic lung tissue.

DISCUSSION

It appears that in man thrombotic masses are formed *in situ* from minute emboli recurring over long intervals, which arise in most instances from an endocarditis of the right side of the heart or venous thrombosis. Neither endocarditis nor venous thrombosis was observed in this dog. It is not generally believed that the small, hardened verrucae, so commonly seen at necropsy on the heart valves of dogs, give rise to emboli.

It seems reasonable to assume that the massive emboli seen in this dog had formed

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over a long period, because there was marked dilatation of the right side of the heart, and the clinical signs were those of a slowly developing embolic occlusion.

When fatal massive embolism of the pulmonary arteries is produced experimentally in the dog, it is necessary to obstruct 70 per cent of the pulmonary circulation. Degrees of embolism less than this cause only transitory circulatory disturbances to which the dog rapidly becomes adjusted.[3] Thus, it appears that the clinical signs resulting from pulmonary embolism would depend upon the size of impacting emboli. If large emboli become impacted, the result is simple mechanical obstruction which must be massive to cause death. On the other hand, when smaller emboli become impacted, there is a rise in pulmonary pressure with cardiac dilatation. With increasing thrombosis of the pulmonary arteries, blood pressure in the right ventricle continues to rise and systemic pressure falls progressively. This is accompanied by acute respiratory distress and a slow cardiac rate which becomes progressively worse until the animal dies.

Development of infarction of the lungs following pulmonary embolism is infrequent in dogs with normal circulation.[1] Experiments have shown that the bronchial arterial circulation to the embolized lung tissue becomes greatly increased. This collateral circulation is sufficiently large to prevent gangrenous necrosis. In view of these observations, the reason for the absence of gangrenous necrosis in the lungs of our dog becomes apparent.

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Leptospirosis in Bitches

Leptospirosis infection in the bitch sometimes results in abortion without any other clinical sign. It may also happen that a litter of pups is whelped by a bitch that appears to be healthy, but is a carrier of leptospirosis. The pups may also seem healthy for a day or so, but then begin to weaken, become emaciated, and die. Upon examination of the bitch, mastitis is usually found, and the milk may be yellow, brown, or even bloody. The pups should be separated from the mother at once, and their treatment should include artificial feeding until weaning time.—*G. C. Kendall, D.V.M., Montgomery, Ala., at 1959 Meeting of the Alabama V.M.A. in Dothan.*

Leptospirosis in Dogs

It is impossible to differentiate clinically between *Leptospira canicola* and *Leptospira icterohaemorrhagiae* infections in the dog. Icterus is not consistently associated with the former; it seems to occur more frequently with the latter in our area.

Chronic interstitial nephritis is a major problem in dogs, especially in males over 4 years of age. Although leptospirosis is no doubt responsible for a good percentage of these cases, we see many in which we are unable to demonstrate any past contact with leptospiral organisms. There is a definite need for continued work on the cause of this syndrome in the dog.—*E. F. Donovan, D.V.M., Columbus, Ohio, at the 1959 Annual Meeting of the Ohio State V.M.A.*

Esophageal Sarcomas and *Spirocerca Lupi* Infections in Dogs

In enzootic areas, dogs about 6 months of age or older may have granulomatous lesions of the thoracic esophagus caused by the localization of *Spirocerca lupi.*

When necropsies were performed on 1,969 dogs from such areas, lesions of spirocercosis were found in 163. Fibrosarcomas or osteosarcomas of the esophagus were found in 16. All occurred in dogs infected with *S. lupi* and all occurred near the localization of the parasite.

Sarcoma of the esophagus of dogs is considered to be rare. It was not found at 1,806 necropsies in which lesions of *S. lupi* were also absent. Statistically, the association of the tumor with lesions of the parasite is highly significant.—*W. E. Ribelin and W. S. Bailey in Cancer, 11 (Nov.-Dec., 1958): 1242.*

Antibiotic Sensitivity Testing and Bacteriophage Typing of Staphylococci Found in the Nostrils of Dogs and Cats

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THE PROBLEM of staphylococcic infections in man has received considerable attention during the past three or four years.[2,5] Staphylococci are widespread and, under normal conditions, are present in the noses or throats of individuals. From the standpoint of public health, any information concerning possible carriers of *Staphylococcus aureus* is of great importance. The present study was conducted to learn what role, if any, the dog or cat can play in the dissemination of staphylococci infective for man.

MATERIALS AND METHODS

Nasal specimens were obtained from 100 dogs and 100 cats by inserting sterile pipe cleaners into the nostrils of each animal. The specimens were then placed in a small amount of nutrient broth which was incubated overnight at 37 C.

Staphylococcus medium No. 110 (Difco) containing brom-cresol-purple (2.5 ml. of a 1% solution of the indicator per liter of medium) was used to isolate all coagulase-positive staphylococci from the specimens collected. On this medium, coagulase-producing staphylococci form orange-brown-yellow colonies after 24 to 48 hours' incubation. Coagulase-negative staphylococci produce white or nonpigmented colonies or will not grow.

Coagulase tests were performed using fresh human plasma as the substrate.

The following bacteriophages, used primarily for typing staphylococci of human origin, were employed: 3A, 3B, 3C, 6, 7, 29, 42B, 42D, 42E, 44A, 47, 47C, 52, 52A, 53, 54, 55, 70, 73, 75, 77, 79, 80, 81, VA4 (routine test dilution=10^{-3} phage particles per milliliter of broth).

Sensitivity tests, using a twofold serial dilution technique,[3] were conducted to determine the minimum inhibitory concentration of penicillin, bacitracin, oleandomycin (Matromycin*), and a 1:2 mixture of oleandomycin and tetracycline (Signemycin*) for each strain that was phage-typed. For practical purposes, a culture was considered sensitive if growth was inhibited by 12.5 μg. or less of the antibiotic per milliliter of broth, and resistant if more than this amount was required.

RESULTS AND DISCUSSION

Seven cats and 23 dogs were found to harbor coagulase-positive strains of *Staph. aureus* in their nostrils. The results of the antibiotic assays, together with the bacteriophage patterns of these organisms, are presented (table 1). Of the 31 cultures tested, 18 were sensitive to penicillin, 25 to bacitracin, 29 to oleandomycin-tetracycline, and all to oleandomycin.

None of the strains isolated from dogs were lysed by the phages comprising the typing set. However, this does not exclude the possibility that the animal may be the carrier source of an organism capable of infecting man. In support of this statement, we have found[4] that almost half of the total number of coagulase-positive staphylococci isolated from nasal specimens and from purulent material from patients in a large general hospital were nontypeable with the routine test dilution.

Staphylococci of types 52A/79 and 29 (both members of group 1, International Basic Set of Phages) were isolated from cats 15 and 100, respectively. This is of considerable interest since published reports[1] describing outbreaks of staphylococcic disease have shown types 52A or 52A/79 as the primary cause of breast abscesses in adults and of infections in newborn infants. Type 29 has been cultured frequently from noses and infrequently from purulent infections in man.[4]

It is proposed that the common house pet

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The author thanks Dr. Harry Reele, A and R Veterinary Hospital, Ridgefield, N.J., for the nasal specimens; he also acknowledges the assistance of Dr. F. C. Fink, Chas. Pfizer and Co., for conducting the antibiotic sensitivity tests.

*Matromycin and Signemycin are produced by Chas. Pfizer and Co., Brooklyn, N.Y.

TABLE I—Sensitivity Testing of Staphylococci Found in the Nostrils of Dogs and Cats

Culture		Minimal inhibitory concentration (μg. or units/ml. of antibiotic)				
		Bacitracin	Oleandomycin	Penicillin	Oleandomycin-tetracycline	Phage type
Cat	1	6.25	6.25	25.0	25.0	NT
	2	1.56	0.78	>100.0	6.25	NT
	4	3.12	3.12	12.5	6.25	NT
	13	3.12	12.5	50.0	12.5	NT
	15	6.25	1.56	25.0	3.12	52A/79
	45	12.5	6.25	50.0	6.25	NT
	100	3.12	0.78	0.19	0.39	29
Dog	5	6.25	1.56	6.25	0.19	NT
	6	50.0	1.56	0.19	0.78	NT
	7	3.12	1.56	>100.0	6.25	NT
	8	6.25	1.56	6.25	0.19	NT
	12	50.0	1.56	0.19	3.12	NT
	13	25.0	3.12	50.0	3.12	NT
	14	6.25	1.56	50.0	6.25	NT
	16	6.25	1.56	1.56	0.39	NT
	17	3.12	1.56	0.19	0.39	NT
	17-2	3.12	1.56	0.19	0.19	NT
	18	6.25	1.56	0.19	0.78	NT
	19	12.5	3.12	6.25	1.56	NT
	20	3.12	1.56	0.19	0.39	NT
	21	6.25	1.56	0.19	0.39	NT
	22	6.25	6.25	50.0	3.12	NT
	24	25.0	3.12	6.25	0.78	NT
	26	25.0	3.12	6.25	0.78	NT
	43	3.12	3.12	50.0	3.12	NT
	44	6.25	3.12	50.0	3.12	NT
	49	6.25	6.25	50.0	12.5	NT
	53	12.5	1.56	12.5	0.39	NT
	72	6.25	3.12	3.12	0.39	NT
	74	3.12	1.56	0.19	3.12	NT

NT—non-typeable.

can serve as an important resevoir or carrier of staphylococci infective for man.

SUMMARY

Nasal swabs from 100 dogs and 100 cats were cultured for staphylococci. Coagulase-positive strains were isolated from 23 of the dogs and 7 of the cats, and typed with bacteriophage and tested for sensitivity to four antibiotics. Two of the cats yielded phage-typeable strains similar to those infective for man. Of the 31 cultures tested, 18 were sensitive to penicillin, 25 to bacitracin, 29 to oleandomycin-tetracycline (Signemycin), and all to oleandomycin (Matromycin).

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Canine Whipworms

Routine treatment of canine whipworms with phthalofyne (Whipcide, Pitman-Moore) has revealed that this parasite is a common cause of diarrhea and is responsible for increased incidence of stool passage. The parasite apparently stimulates bowel activity, but this clinical sign is not entirely related to wormload. One worker has recovered 2,452 whipworms from a dog following treatment.—*George R. Burch, D.V.M., Indianapolis, 1959 Meeting of the West Virginia V.M.A.*

Candida Albicans on Grass

This fungus was isolated from grass from a New Zealand pasture. It was believed to have originated from the alimentary tract of animals such as sheep, dogs, hedgehogs, and opossums, all of which are known to carry the organisms. —*Nature, 181, (1958): 1287.*

Lungworms in a Dog

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STANTON E. BOWER, D.V.M.

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Since canine lungworms have not been seen by us previously and because incidence of infection is apparently low, the following case report should be interesting to others.

CASE REPORT

A female Boxer, 7 years old, was examined on Sept. 25, 1958, because of coughing, poor appetite, and rapid loss of weight during the preceding week. She had a normal body temperature, some pathological changes in the lungs, and a rapid, weak, heartbeat with no sinus arrhythmia. Respirations were normal. There was slight purulent vaginal discharge. White blood cell count was 32,300 per cubic millimeter. Urine analysis was normal except for 1+ albuminuria. A diagnosis of cardiac insufficiency and metritis was made, and the dog was treated with antibiotics, cardiac stimulants, prednisolone, and vitamins.

On October 6, ovariohysterectomy and splenectomy were performed, the latter because examination of the spleen revealed multiple necrotic areas. The recovery, after surgery, appeared uncomplicated but recuperation was never complete. The dog got along well while in the hospital, but when taken home, coughing and inappetence recurred. A month after the beginning of treatment, euthanasia and necropsy were performed at the request of the owner.

On gross examination, the lungs had little normal tissue and were extremely indurated. Several worms 6 to 8 inches long were found in the bronchi. Specimens of the lungs and the worms were submitted to a laboratory for examination. The parasites were identified as *Capillaria aerophila*. Histopathological examination of the lungs indicated extensive pneumonitis with infiltration of leukocytes. Leukocytes and plasma cells were in both alveolar and interstitial areas. In some instances, the normal architecture of the lung was lost. Most areas showed fibrinous replacement, meaning that inflammatory changes were both acute and chronic.

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The authors thank Dr. R. W. McIntyre of the Los Angeles County Livestock Department for his cooperation and assistance in identifying the parasite.

DISCUSSION AND CONCLUSION

The dog had not shown severe respiratory distress except for the cough which was serious at times. Unfortunately, a stool examination was not made. Radiographs would have revealed serious pathological changes in the lungs, but a stool examination might have given an accurate diagnosis. Recognition of these oversights emphasized the fact that no simple routine examination or procedure should be neglected when dealing with a nonresponsive case.

Experimental Evaluation of a Dual (Distemper-Hepatitis) Vaccine and Its Use in the Field

A safe and effective vaccine, which will immunize dogs both against distemper and infectious canine hepatitis by a single inoculation, could be offered as an article of commerce, provided care were taken to insure that it contained not only adequate amounts of each virus, but adequate amounts of immunizing virus.

One year after such vaccination, 4 of 5 dogs still had a sufficient antibody titer to protect them against distemper virus. To insure protection for the other 20 per cent that become susceptible, it is advisable to revaccinate all dogs one year after vaccination with chicken embryo canine distemper vaccine. An alternative would be to test a dog's serum for antibodies. If the titer is negative or quite low, the dog would then be revaccinated.

A nomograph relating the serum titer of the mother to the age at which her progeny will respond to vaccination for distemper has been developed for routine clinical application. It was field tested with success on 57 dogs from 13 litters where the age of vaccination ranged from 4 to 12 weeks, and a statistical analysis indicated that use of the nomograph will result in at least 95 per cent vaccination success rate. This procedure could supplant the practice of giving antiserum for temporary protection of young pups.—*J. H. Gillespie, V.M.D., Ithaca, N.Y., at the Midwinter Conference of the California V.M.A. in Davis, Feb. 2, 1959.*

Hydrogen Sulfide Poisoning of Chinchillas

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Fargo, North Dakota

Hydrogen sulfide (H_2S) poisoning appears to be rare in veterinary reports. Two instances of such poisoning are reported[1] in livestock. In one instance, the animals drank contaminated water; in the other, decomposing manure yielded amounts of H_2S gas toxic to animals stabled above the manure pits.

The following case of H_2S poisoning of chinchillas is recorded.

CASE HISTORY*

On Dec. 23, 1958, the owner of a colony of chinchillas submitted 4 dead ones with the following information: at 6:45 p.m., he had put coal in the stove where the chinchillas were housed. At 10:45 p.m., he returned home and found 16 of 18 chinchillas dead. The 2 live ones showed no evidence of illness, but their cage was near a source of fresh air. The owner reported that he noticed an "acrid" odor in the air of the room.

Carbon monoxide poisoning was suspected, but the postmortem examination was not confirmatory. Chemical tests for CO were negative.

Instead of a bright pink color, the mucous membranes were purple, indicating that a cyanotic condition other than CO poisoning was the cause of death. The lungs were gray and edematous; the livers were also gray. A silver coin placed in contact with these tissues was turned brown to black in about 20 minutes.

A distillate obtained from fluid containing blood and liver produced typical crystals of lead sulfide when collected in a solution of lead acetate.

From the Department of Veterinary Science, North Dakota Agricultural College, Fargo.

Published with the approval of the director of the North Dakota Agricultural Experiment Station.

The authors thank Mr. Pat McIlwain for assistance in the chemical tests.

[1]Garner, R. G.: Veterinary Toxicology, Bailliere, Tindall and Cox Ltd., London, England, 1957.

*This case was referred to our laboratory by Dr. H. W. Kinne, Jamestown, N.Dak.

Blood Disorders in Cats

Anemias are a serious and frequent challenge to the cat practitioner. Specific infectious anemia offers the best prognosis, since it usually responds well to transfusion and a course of oxytetracycline. Anemias associated with other types of infection are, however, much more numerous. The outcome of these is much less certain, depending on the type and site of infection and its susceptibility to therapeutic agents. Toxic depressions of the marrow resulting from a variety of drugs and poisons have been encountered. Malignant infiltration of the marrow by leukemic cells is also an important cause of anemia in cats.—*Jean Holzworth, D.V.M., Boston, Mass., at 1959 Meeting of the Alabama V.M.A. at Dothan.*

Disease Conditions Prominent in Cats

Osteogenesis imperfecta is a congenital bone disorder of kittens, associated with deficient calcification of spicules and a tendency to multiple fractures. Calcium, vitamin D, and testosterone are employed with some benefit.

Steatitis or "yellow fat disease" has been encountered in a number of young adult cats fed substantial amounts of red tuna.

Arterial embolisms to the peripheral arteries are a prominent cause of sudden limb paralysis and usually originate in some type of heart lesion.

Lymphoid neoplasms constitute by far the most frequent malignancy in the cat. Gross tumors occur most often in the anterior mediastinum, kidneys, and intestine. Spleen, liver, and lymph nodes are often involved. Among the less common sites are the nasal passages, orbit, larynx, stomach, heart, adrenals, and skin.—*Jean Holzworth, D.V.M., Boston, Mass., at 1959 Meeting of Alabama V.M.A. at Dothan.*

Comparing Two Antimycotics

When the antifungal substances, amphotericin B and nystatin (Mycostatin, Squibb) were used experimentally against *Candida albicans* and *Mucor pusillus* infections in mice, both drugs were efficacious against both infections; however, amphotericin B seemed more active and less toxic than nystatin.—*Vet. Bull. (Feb., 1959): Item 349.*

What Is Your Diagnosis?

Because of the interest in veterinary radiology, a case history and radiographs depicting a diagnostic problem are usually published in each issue.

Make your diagnosis from the picture below — then turn the page ▶

Figure 1

History.—A male Boxer, 3½ years old, had been used frequently at stud. During the previous three months, there had been a gradual decrease in appetite and weight. His back had become slightly arched and sensitive to pressure and the posterior portion of the rib cage had become noticeably barrel-shaped. His gait and ability to copulate were not affected. However, one morning while mounting a female he let out a distressing yelp, fell flat on his side, and staggered to his feet with difficulty. When he tried to walk he wobbled and dragged his toes. The abdominal muscles were tense and the back was more arched and sensitive to pressure than before. A lateral recumbent radiograph (fig. 1) was taken.

Here Is the Diagnosis

(Continued from preceding page)

Diagnosis.—Vertebral osteomyelitis involving at least the last two thoracic and the first two lumbar vertebrae.

Fig. 2—Radiograph, lateral standing view, of the dog's spine (60 days after treatment was started), showing the exostosis to be receding. The outlines of the vertebrae were again sharply defined.

Comment.—Vertebral osteomyelitis is not common in the dog and the lesion, until studied carefully radiographically, may be mistaken for an osteosarcoma or a tumor associated with the parasite *Spirocerca lupi*. External injury being excluded, hematogenous involvement from Staphylococcus, Streptococcus, or Brucella organisms are the most likely causes of infection. Osteomyelitis is both destructive and proliferative. Such a lesion shows marked bony proliferation, as evidenced by increased density of the structure, accompanied by necrosis and absorption of bone. Bony spurs develop and produce ankylosis or fusion of the bodies of involved vertebrae. There is destruction of the intervertebral disks.

In the treatment of vertebral osteomyelitis, the major problems are (1) to stop the infection, and (2) to prevent destruction or obstruction of the spinal cord by bony growth of new tissue into the canal or by fracture and collapse of the vertebral body.

The dog was given large daily doses of penicillin and streptomycin, and was confined to a cage, since body casts, especially in the male dog, are not practical. At the end of three weeks, his gait had improved and the radiographs showed the lesion to be no worse. Radiographs at the end of 60 days (fig. 2) showed the exostoses to be receding. The density of new bone had decreased and the outlines of the affected vertebrae were again sharply defined. Appetite and weight had increased, the arch in the back had diminished, and the dog wanted to play. Medication was stopped

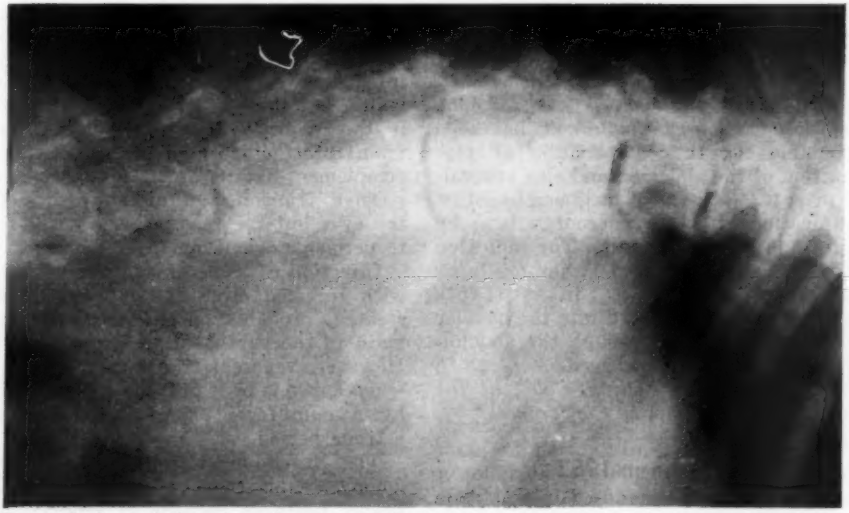

Fig. 3—Radiograph, lateral standing view, of the dog's spine (6 months later), shows no evidence of necrosis or new proliferation. Notice the fusion of the last two thoracic vertebrae and the first two lumbar vertebrae.

and the dog was given freedom of a runway.

Radiographs at six months (fig. 3) showed no evidence of areas of necrosis or new proliferation but there was considerable absorption of the previously proliferated bone. Fusion had developed between the last two thoracic vertebrae and between the first two lumbar vertebrae, leaving a rather normal-appearing disk space between the last thoracic and first lumbar vertebrae. At this time, the dog was returned to stud, and was able to breed in a normal fashion.

This report was submitted by Dr. Wallace R. Eagle, Glen Ellyn, Ill.

Our readers are invited to submit histories, radiographs, and diagnoses of interesting cases which are suitable for publication.

Correction—What Is Your Diagnosis?

The picture of the stifle on the second page of the April 15, 1959, "What's Your Diagnosis?" (page 364) is not from the same dog as the one pictured on page 363; it is from another dog to show the normal relationship of the femur and tibia.

Canine Strongyloides Infection

Canine Strongyloides infection is characterized by diarrhea and is a kennel problem. The diagnostic fecal flotation is made by the centrifugation-flotation method, using a 33 per cent zinc sulfate solution.

When this infection is complicated by canine distemper, the prognosis may be grave. In addition to the use of dithiazine, treatment should be directed toward improved nutrition and control of diarrhea.

Carrier dogs may bring this infection into uncontaminated kennels.—*George R. Burch, D.V.M., Indianapolis, 1959 Meeting of the West Virginia V.M.A.*

Skin Disorders of Small Animals

Superficial lesions caused by fungi are frequently observed in dogs. The common ringworm is caused by *Microsporum canis* which will fluoresce under the Wood's light and responds well to treatment with fungicides. *Trichophyton mentagrophytes,* however, does not fluoresce and may not have the characteristic circinate lesions of *M.*

canis. Identification is by culture. The lesions may be generalized and resistant to treatment.

Cystitis, caused by microorganisms such as *Aerobacter aerogenes*, *Pseudomonas aeruginosa*, and *Escherichia coli*, has been responsible for the complication of pigmentation of the abdomen and also generalized pruritus. Treatment has been based on identification of the microorganism by culture and sensitivity tests. The indicated antibiotic is administered either orally or parenterally. Antibiotics in suitable solution may be introduced into the bladder either by catheter or through the abdominal wall by a hypodermic needle.—*Lloyd C. Moss, D.V.M., Fort Collins, Colo., at the 1959 Colorado Veterinary Conference.*

Scrapie in Australia in 1952

Scrapie had been diagnosed in Australia only in a group of 10 Suffolk sheep imported from Britain late in 1950. In December of 1951, 1 ewe developed a mental disturbance and was killed. Two others developed a skin irritability resulting in constant rubbing. Both continued to eat and drink well and showed no incoordination. One finally weakened rapidly for ten days and died Jan. 24, 1952; the other continued to lose its wool and general condition, and was killed March 8. A third ewe developed skin lesions in January and was killed when moribund in May, 1952.

Suspensions of brains of affected ewes were inoculated intracerebrally into 14 unexposed sheep, but none developed skin irritation or other clinical signs of scrapie. However, scrapie developed about the same time in the original flock in Britain. Dystocia may not be associated with scrapie, but it occurred in several of the imported ewes. —*L. B. Bull et al. in Austral. Vet. J. (July, 1958): 213.*

Ovine Brucellosis in Australia

A survey of 916 rams, in 1953, showed 16.5 per cent suffering from clinical epididymitis. Of 188 clinically affected rams tested, 107 gave positive complement-fixation reactions and, from many of these, a Brucella-like organism was isolated.

Ewes are believed to play a minor role in the spread of the disease; however, they can be infected by the ram and the infection may persist for several years, or it may disappear after a few months. Some infected ewes may abort or produce weak lambs, but there is no evidence of abortion in the majority of diseased flocks. Lambs from infected mothers often react to the complement-fixation test, probably due to passive transmission of antibodies from the ewe, but the reaction was never found to persist longer than three months.

Infection of rams from mating or being with infected ewes has not been demonstrated, probably because no bacteria remain in the vagina at the time of service. However, venereal transmission can occur when a ewe is bred first by an infected then by a noninfected ram during the same estrous period.

The infection rate is often highest among young rams which are kept in a group, probably because of sodomy. Rams with unilateral epididymitis may be fertile, but those with bilateral epididymitis are often almost sterile. Rams with no palpable abnormality may react to the complement-fixation test and *Br. ovis* may be cultured from their semen.—*J. Keogh et al. in Austral. Vet. J., 34, (Dec., 1958): 412.*

Erysipelas in Nutria

On a coypu (nutria) farm in Poland, several animals died within a short period with no visible clinical signs. One of them was examined at the Laboratory of Pathology. The only pathological feature found was the markedly swollen wall of the duodenum, with its layers loosened, grayish yellow, and showing many spots of hemorrhage and necrosis.

Histologically, there was acute inflammation with necrotic foci in all layers of the wall. Because of the state of the material when received, no direct search for the responsible microorganism could be made; however, inoculations of mice with organ suspensions and with blood produced death and necropsy features typical of erysipelas.

Smears from the mice material revealed the microorganisms characteristic of this disease, and the corresponding cultures exhibited the usual hemolytic, chemical, and fermentation reactions. The authors point out the atypical character of the erysipelas lesions in the coypu.—*Med. Weteryn., 15, (Jan., 1959): 16.*

Observations on Eating in Cattle

The production of saliva, chewing movements, motility of the reticulum, and quantitative changes in content of the rumeno-reticulum were studied in 5 cows and 2 steers, with rumen fistulas, while they were given a variety of rations.

For every 10 lb. of feed consumed, the following quantities of saliva were added during mastication: with hay—43 to 57 lb.; with concentrates—12 to 15 lb.; and with grass—53 lb. of saliva. Although the rate of secretion of saliva was faster with concentrates, they were swallowed too quickly for much saliva to be added. With many diets, the production of saliva while eating must exceed 100 lb. daily.

The rate of movement of the jaw did not decline even when large meals of hay were eaten. Rate of contraction of the reticulum was relatively constant throughout a meal of hay, but it was increased initially, then declined, when concentrates were ingested. There were no indications of fatigue of the jaw muscles or rumeno-reticular muscles, or of decrease in salivary secretions. When an animal eats concentrates, the amount of intake is probably limited by factors other than "fill."—*Vet. Bull. (Jan., 1959): Item 166.*

Prevention of "Yellow Fat" in Mink

In experiments with mink cubs, "yellow fat" was induced by feeding marine fats. The disease was prevented by the addition of antioxidants to the feed or by changes in the nature and quantities of fat in feeds without the addition of antioxidants.

Results indicate that the disease is primarily due to the contents of marine fat in the feed. Ten per cent marine fat caused extensive development of yellow fat with a high degree of mortality; about 6 per cent caused yellow fat of considerable severity; while about 5 per cent caused typical fatty tissue transformations but no deaths.

The addition of 50 to 100 mg. of methylene blue per kilogram of feed had the same prophylactic effect as about 50 mg. of *alpha* tocopherol acetate. Both compounds lessened mortality and reduced the peroxidation in the fatty tissues.

The most satisfactory method of preventing yellow fat in mink cubs is to control the fat composition in feeds so that the marine fat does not exceed 3 to 4 per cent. A feed containing 30 per cent mackerel together with lean fish presumably presents no risks.—*Sv. Dalgaard-Mikkelsen et al. in Communications from State Veterinary Serum Laboratory, Copenhagan, Denmark.*

Protein in Chronic Renal Disease

In chronic renal disease in man, where the ability of the body to excrete the products of protein metabolism is limited, an excess protein intake (more than 1 Gm./kg. body wt.) would seem undesirable. However, research indicates that the requirement for dietary protein is increased in chronic renal disease; therefore, therapeutic regimens based on minimal protein intake of normal individuals may lead to gradual protein depletion in the subject.—*Nutr. Rev., 16, (Nov., 1958): 329.*

Fat in the Diet of Growing Chicks

When fat calories in the form of corn oil were substituted for glucose calories in rations for chicks, it resulted in improved weight gains and in greater protein and energy utilization. The best over-all performance was with 20 to 38 per cent of fat in the total metabolizable energy of the diet. However, the beneficial effect was pronounced even at the highest fat level (97%). The beneficial effect of the fat was most pronounced in diets with the highest protein level.—*Poult. Sci. (Sept., 1958): 1075.*

Fat additions have not always been beneficial—linseed, cottonseed, and soybean oils sometimes show deleterious results. Tallow (higher-melting animal fat) is not as well digested as lard or grease (fats with lower melting points).—*The Feed Bag (Jan., 1959): 31.*

Vitamins in Poultry Disease

When five times the normal level of vitamins was fed to broilers infected with coccidiosis, at Alabama Polytechnic Institute, there was a slight weight gain and feed conversion improvement. When fed to birds with mild chronic respiratory disease, both gain and feed conversion were improved, but there was no effect when CRD was severe.—*AFMA Nutr. Abstr. Jan., 1959.*

Editorial

What's Your Practice Worth?

When a physician dies in Los Angeles County, his widow will probably receive a letter from the welfare committee of the county medical association offering assistance in disposing of the doctor's practice in a fair and equitable manner.

According to an article in *Medical Economics*, of March 16, 1959, this letter may be no more than a friendly gesture if the widow happens to be a capable businesswoman. But, in most cases, she needs guidance from those who know about medical practice finances. In the case of the Los Angeles widow, the advice and counsel she receives has been tested by five years of successful application.

Typically, the widow would be asked to furnish office records and last year's income tax forms to provide a basis for determining the doctor's gross income from practice. Then she would be advised to offer the practice for sale immediately at a flat 15 per cent of the practice gross income. Free advertising space would be available in the county and state medical publications for this purpose. She could also expect to sell for cash the office equipment, furniture, and other physical assets.

Realistic Figure

Many veterinarians will be surprised that medical practices are valued at only 15 per cent of the annual gross income. It has been said, as a rule of thumb, that a veterinary practice is worth about 50 per cent of its annual gross. The 15 per cent figure is probably more realistic. After all, your widow can't sell your capabilities, your personality, your contacts, your business acumen, or the many other things which build a practice. Too, if the "asking" price is so high that a buyer cannot be readily found, the value of the practice decreases rapidly.

[T]raining for Widowhood?

The Los Angeles County Medical Association's welfare committee not only offers to advise widows of deceased physicians but is attempting through women's auxiliaries to prepare them for widowhood. Their advice to wives: "Don't get so wrapped up in home and hearth that you forget to learn what makes your husband's office tick." The committee will also send to members of the association a blank booklet which, if filled in by the doctor to show his current insurance policies, bank accounts, investments, etc., will tell his survivors what he's worth and where to find his assets.

Programs of women's auxiliaries rightly include flower arranging and style shows, but wives of professional people could profitably devote a little program time to the problems of widowhood too. Helping the wives of deceased colleagues might even be a worthwhile project for local veterinary associations.

Antibiotics—The Changing Pattern

The pattern of antibiotic activity is changing. The so-called "broad-spectrum" antibiotics (chlortetracycline, oxytetracycline) seem to be losing their ability to increase rate of gain and improve efficiency of feed utilization. The "narrow-spectrum" antibiotics (bacitracin and penicillin), are apparently still effective.

The reason for this change in pattern may involve improvement in the product itself, or an increasing emergence of resistant bacteria, especially Escherichia, Aerobacter, Klebsiella, Proteus, Pseudomonas, and Staphylococcus, with a concurrent increase in Candida and yeasts.

Selectivity of the antibiotic is a more accurate measure of value than range of spectrum. Noninterference with normal types of B vitamin-producing coliforms is a long step toward maintaining a normal balance between the many types of microorganisms present in the gut. This is fully as effective a way to control the secondary invaders as attacking them with medication. Acting together, the normal microflora and gram-positive medication help nature in the greatest degree.

Antibiotics added to the feed or drinking water exert their strongest influence on bacteria in the digestive tract. Prolonged medication with antibiotics which destroy the normal types of coliform bacteria often results in emergence of resistant strains which produce toxins and invade the body tissues, instead of remaining in the digestive tract and antagonizing Candida, Proteus, Pseudomonas, and other detrimental microorganisms. — *R. C. Klussendorf, D.V.M., in Am. Feed and Grain, Nov.-Dec., 1958.*

Abstracts

Immunogenicity of Rabbit-Adapted Foot-and-Mouth Disease Virus

Rabbit-adapted virus proved to be of no value for the preparation of aluminum hydroxide inactivated virus vaccines. Type O virus of the 111th serial passage in rabbits was used as a modified live virus vaccine. This virus retained a low degree of pathogenicity for cattle. Following intracutaneous injection, 2 of 21 cattle in controlled experiments and 2 of 142 cattle in field trials became clinically infected.

In the controlled experiments, 79 per cent of the nonreactors resisted challenge with cattle virus three weeks after vaccination. In the field trials, one third of the cattle initially susceptible developed an adequate antibody titer for protection which persisted throughout a six-month period of observation. There was also an increase in antibody titer in those cattle initially immune.—[*R. G. Cunha, I. Torturella, and U. M. Serrão: Studies on Rabbit-Adapted Foot-and-Mouth Disease Virus. II. Immunogenicity. Am. J. Vet. Res., 20, (Jan., 1959): 138-144.*]

Bluetongue Virus in Tissue Culture

Bluetongue virus obtained from the blood of a sheep in the acute phase of the disease was isolated on monolayers of trypsinized lamb kidney cells and was propagated both in these cells and in a strain of human amnion (Fernandes), showing cytopathological changes with increasing virus titer.

An egg-adapted virus was passed serially eight times in tissue culture, assuming at this point a theoretical titer dilution of 10^{-35}, which offered ample evidence of viral multiplication.

The susceptibility of 10 cell lines has been studied. Cells were observed with phase contrast microscopy and after staining in order to determine the course of the lesions caused by the virus.

Time-lapse, phase-contrast cinematography also was used in the study of the cell-virus system. Thus far, no specific lesion has been found.

Cytological degeneration in cell cultures can be neutralized by immune serum and, therefore, is useful in the diagnosis of bluetongue.—[*Mario V. Fernandes: Isolation and Propagation of Bluetongue Virus in Tissue Culture. Am. J. Vet. Res., 20, (March, 1959): 398-413.*]

Drugs Affecting Myoclonia Congenita in Pigs

Parenterally administered epinephrine in dosages of 0.05 to 0.15 mg./kg. of body weight produced a marked aggravation of existing tremor and, in many instances, a temporary resumption of tremor in recovered pigs. These effects were observable for as long as 24 hours in some pigs.

Subclinical cases of myoclonia congenita have been demonstrated by injection of epinephrine. Histamine, cold, and excitement produced similar results. Auditory and painful stimuli, and ingestion of cold liquids, all produced transient aggravation of existing tremor. The effects of cold were rapidly reversible when environmental temperature was raised.—[*M. W. Stromberg: Studies on Myoclonia Congenita. III. Drugs and Other Factors Affecting Severity of Tremor in Pigs. Am. J. Vet. Res., 20, (March, 1959): 319-323.*]

New Anthelmintic for Cattle

In a critical anthelmintic trial, a new experimental organic phosphate compound was found to have marked nematocidal activity against several genera of Trichostrongyloidea in cattle. From 90 to 100 per cent of Trichostrongylus spp. in the abomasums and small intestines, as well as 87 per cent of Cooperia spp. in the small intestines and 66 per cent of Ostertagia spp. in the abomasums, were removed by a single dose of 120 to 130 mg./-kg. of body weight.

This dosage produced toxicosis in 5 of 10 animals, but it was severe in only 1 animal.

No action against adult *Fasciola hepatica* was observed.—[*Norman F. Baker, Paul H. Allen, and James R. Douglas: Trial with a New Organic Phosphate as an Anthelmintic in Cattle. Am. J. Vet. Res., 20, (March, 1959): 278-280.*]

An Erysipelas Culture Agglutination Test

The serological test correlates amounts of specific circulating antibody with challenge resistance of swine to virulent *Erysipelothrix rhusiopathiae* organisms. The test is performed by culturing selected *Ery. rhusiopathiae* organisms on tryptose broth containing sterile, inactivated serums of swine donors in 1 and 5 per cent amounts and incubating the mixtures at 37 C. for 18 hours.

Serums of immune donors cause agglutination in both dilutions; those of partially immune donors at 5 per cent only; and those of susceptible donors cause no agglutination.—[*E. A. Lozano, W. D. Parker, and L. D. Jones: An Erysipelas Serum-Culture Agglutination (ESCA) Test. Am. J. Vet. Res., 20, (March, 1959): 394-397.*]

Blood Serum Vitamin B_{12} Levels in Swine

Six sows that had been fed a vitamin B_{12}-deficient diet for two years were used in one experiment. Three were continued on the diet, and three on the diet plus 50 μg. of vitamin B_{12} per day for 100 days. The daily oral dose was increased to 100 μg. for a second 100-day period and to 200 μg. for a third 100-day period. Blood samples were taken during the last 60 days of each period and assayed with *Euglena gracilis*. There was a definite relationship between the oral intake of the vitamin and the serum content over the dosage range used.

Six gilts, previously fed a commercial ration, were fed the deficient ration for five and a half

months. Three of them were also given 300 to 400 μg. of vitamin B_{12} daily. The serum levels of the treated gilts responded maximally within two weeks; the untreated gilts' serum levels decreased within six to eight weeks to base levels similar to the control sows in the first experiment.

The composition of the deficient diet is given. —[*G. L. Frederick and G. J. Brisson: Influence of Oral Intake of Vitamin B_{12} on Total Blood Serum Vitamin B_{12} Levels in Swine. Am. J. Vet. Res., 20, (March, 1959): 338-340.*]

Foreign Abstracts

Salt Poisoning and Pasteurellosis of Swine

Garbage-fed hogs in the author's practice often got too much salt in the feed from salted vegetables and scraps of salt fish and corned beef, or the water in which these foods had been soaked. When water intake was restricted, various degrees of salt poisoning occurred. In the presence of a subclinical Pasteurella infection, this precipitated outbreaks of acute septicemia.

In addition to the typical lesions of pasteurellosis, the animals had a deep necrosis of the gastric mucosa and tenacious mucus in the mouth. The chlorides in the liver, calculated as sodium chloride, varied from 0.5 to 0.7 per cent (normal, 0.17-0.28%). The chlorides in the stomach content varied from high normal (0.65%) to 1.5 per cent. In animals that had died of pasteurellosis, paratyphoid, or pneumonia without salt poisoning, the chloride content of the liver and stomach was normal.—[*N. A. Alexandrov: Increased Salt Content of the Ration—A Precipitating Factor in Pasteurellosis of Swine. Veterinariya, 35, No. 12, (Dec., 1958): 61-62*]—ROBERT E. HABEL.

Tuberculin Reactions in Dogs

Tuberculin was applied intradermally in 0.1-ml. amounts on the lateral surface of the thorax. The reactions were determined by measuring the increase in thickness of skin at the site of injection in 24, 48, and 96 hours. With 1,500 International Units (I.U.) of Old Tuberculin (O.T.), an increase in thickness of 3 mm. or more and for 5,000 I.U. an increase of 3.5 mm. or more was considered a positive reaction. Lesser increases were designated as nonspecific on the basis of tests on nontuberculous dogs. The use of 1,500 I.U. of O.T. resulted in significant reactions in only 15 per cent of experimentally infected dogs; 5,000 I.U. gave significant reactions in only 50 per cent of the infected dogs. It was concluded that intracutaneous tests with O.T. are not reliable in dogs.

Studies on a heat-concentrated synthetic medium tuberculin (HCSM) showed that this material gave fewer nonspecific reactions. Also, it was found that a measure of the increase in thickness of skin was more reliable than the appearance of the reaction such as erythema, edema, and necrosis. With HCSM, increases in thickness of skin of 2.0 mm. or more for 500 I.U. and 3.0 mm. or more for 5,000 I.U. were found to be significant. Positive reactions could be detected nine days after experimental infection. All infected dogs had positive reactions with HCSM. Normal dogs failed to present any significant reactions. Any reaction in nontuberculous dogs subsided after 24 hours, whereas the positive reactions reached maximum thickness in 48 hours.

It was concluded that, except for moribund animals, the use of HCSM was reliable in distinguishing nontuberculous dogs from those that were infected experimentally.—*Olav A. Berg: Tuberculin Reactions in Dogs. Acta Tuberc. Scand., Suppl. 43, (1958): 1-48.*—ALFRED G. KARLSON.

Books and Reports

Eleven Blue Men

This collection of 12 stories about some medical puzzles that have faced the public health officials of American cities is fascinating recreational reading for anyone interested in medicine.

It includes the story of 11 aged and dilapidated men who turned blue and died one day in New York; also, the story of a man in Harlem who could smell, but not feel, that a cigarette was burning the flesh of his fingers. These and others are thrilling accounts of medical detection which originally appeared in the *New Yorker.*

The book is of special interest to students of veterinary public health.—[*Eleven Blue Men. By Berton Roueche. Paper bound; 189 pages. Berkley Publishing Corp., 145 West 57th St., New York 19, N.Y. 1953. Price 35 cents.*]

Symposium on Latency and Masking in Viral and Rickettsial Infections

This is the report of a symposium concerned with the mechanisms of viral infections in animals, insects, plants, and bacteria; with fundamental aspects of cellular biology; and with clarification of terminology relevant to latent infections in these systems.

Subject matter areas were: viral characteristics leading to masking and latency (6 papers); factors of host cell and environment contributing to masking and latency (6 papers); the role of inhibitors in masking and latency (3 papers); and consideration of concepts and terminology of viral infection (1 paper). Panel and audience discussion accompanied each session.

While the underlying theme of the symposium was the fundamental aspect of cellular biology as the virus-cell reaction, there was consideration and discussion of the virus-host relationship. The papers are of superior quality and the discussion contributed much to the proceedings. The book's greatest value will be to readers interested in fundamental virology, but there is much interpretive material applied to the clinical sciences. This book

is highly recommended for research workers.—[*Symposium on Latency and Masking in Viral and Rickettsial Infections—the proceedings of a conference held at the University of Wisconsin, Madison, Sept. 4-6, 1957. Edited by D. L. Walker, R. P. Hanson, and A. S. Evans. Burgess Publishing Co., Minneapolis, Minn. 1958. Price not given.*]—C. H. CUNNINGHAM.

The Theory and Practice of Nutria Ranching

Nutria ranching in both the United States and Canada has reached a point where authoritative information on this phase of the fur-farming industry is needed. The person desiring information on nutria will find much valuable information in this book. The reader gains the impression that the author has had considerable practical experience in the care and raising of these animals.

Some sections of the book are rather trite, particularly the section entitled, "Introduction to Genetics." Twenty pages are used to discuss Mendelian Laws and Theories of Genetics, but nothing is mentioned about genetics relative to the various strains and types of nutria. Likewise, some 34 pages are devoted to a section entitled, "Nutria Feeding," but it is not until the last 14 pages of the section that there is any particular information given on the feeding of nutria.

The wording of the section on diseases affecting nutria leaves much to be desired. Approximately a fourth of the book is devoted to what is designated as "Diseases, Illnesses, and Parasites." Antibiotics are mentioned by trade name only. The information on the various disease conditions is superficial, and was obviously written for the laity.

It is the reviewer's opinion that the book would have been more interesting and to the point if the author had confined his discussion to nutria and had given much less space and attention to those topics that are relevant to animals in general.—[*The Theory and Practice of Nutria Ranching. By George V. Kinsel. 231 pages. Fur Trade Journal of Canada, Toronto, Ont. 1958. Price not given.*]—A. H. KENNEDY.

Genetic Resistance to Disease in Domestic Animals

This stimulating book is primarily to "review some of the evidence showing that domestic animals vary in genetic susceptibility to disease." Over half of the book is devoted to poultry because (1) there has been more experimental work with breeding for disease resistance with chickens than for all other farm animals; and (2) the author and associates have contributed a large portion of the work with poultry. They demonstrated that it was feasible to breed strains resistant to leukosis. They were also able to maintain high egg production. When hatching eggs of the resistant stock were entered in a random sample test for three years, the resistant stock was lowest in mortality from all causes and was highest in income for chicks started.

This is in direct contrast to most other experimental attempts to raise the level of resistance to disease in poultry or other farm animals, but it has not been followed by practical application. This gives pause to the parting admonition, "the most valuable contributions of geneticists and their allies in the experiment stations are likely to be not the production of strains of animals for wide distribution, but (1) the demonstration that it is feasible to raise resistance to disease by selection, and (2) the discovery of the best ways by which other breeders can do so." The author tries to stimulate the enthusiasm of veterinarians and breeders of farm animals to use this approach, particularly for diseases to which exposure is inevitable and when other treatments are unsatisfactory or unprofitable.

Inherited defects, resistance to heat, light, inadequate diet, aberrant metabolism, influence of light and other environmental elements are discussed in relation to inheritance, but the main emphasis is on diseases due to bacteria, viruses, protozoa, nematodes, and molds. The least satisfactory chapter is the one entitled "Ways of Resisting," due to the paucity of factual evidence in so many cases. Its greatest value lies in the nullification of our confidence in some of the "accepted" concepts, especially with mastitis. This is especially interesting because of the conclusion of a committee of the American Dairy Science Association that "mastitis is the most costly disease of dairy cattle not under satisfactory control."

Perhaps the inclusion of some elementary genetics might have been appreciated by some readers. Also, the author may have been a little too enthusiastic about the possible practical application in some instances. The book is well written, remarkably free from obvious errors, is in an easily readable style, and is not burdened with formulas and other tedious material. It is not a text on genetics nor on diseases of domestic animals, but should be read by every veterinarian as well as every animal husbandman charged with direction of animal breeding.—[*Genetic Resistance to Disease in Domestic Animals. By Frederick B. Hutt. 189 pages; illustrated. Comstock Publishing Associates, Ithaca, N.Y. Price not given.*]—BRUCE L. WARWICK.

Practical Use of the Microscope Including Photomicrography

This work of 493 pages, 173 figures, a glossary, and an appendix of very useful reference material should be available for use by anyone using a microscope.

Each of its 26 chapters is written in understandable language as an aid for the beginner as well as the experienced user. Many hints are given for improving results to be obtained.

The evolution of the microscope helps in building appreciation of this instrument as we have it today.

The bibliography, glossary, and appendix are valuable for quick reference.

Chapters II to XII inclusive describe the different types of microscopes and their use and are well written.

The electron microscope (chapter X) is a comparatively recent development in the field of microscopy and is not a practical instrument for a student beginning the study of structure. The techniques for preparing the specimens or objects to be studied are well described and a list of selected references is supplied.

The remaining chapters concern the determination of the system of optical consonants of chemical and mineral crystals, elementary optics of the microscope, achromatic, fluorite, and apochromatic objectives, eyepieces, substage condensers for transmitted light, refracting and reflecting dark field condensers; Rheinberg differential color illumination, illuminants for the microscope, critical illumination; Nelson and Kohler methods, illumination by incident light, light filters and cooling cells, micrometry; counting chambers and cells; finders for the microscope, mounting media for specimens, microprojection and drawing with the microscope, and photomicrography.

This well-written and illustrated text will meet the need of those engaged in microscopy.—[*The Practical Use of the Microscope Including Photomicrography. By George Herbert Needham. Charles C Thomas, Springfield, Ill. 1958. Price not given.*]—J. D. GROSSMAN.

Physio-Pathology of the Reproduction and Artificial Insemination of Domestic Animals

The author calls attention to the growing importance of the increased value of livestock during recent years and the intimate relationship of problems related to production and reproduction.

A list of over 400 articles and authors will be found useful for those who wish to investigate a particular phase of the subject not exhausted by the author.

Like other texts, it attempts to satisfy the appetites of two widely separated groups of people, *i.e.,* those engaged in fundamental research and those who are trying to make application of the fundamental precepts. The author states that he has tried to make the text useful for both groups, but more especially for the clinician.

One of the most valuable parts of the texts is a table of contents that serves as a guide as one approaches a clinical problem in reproduction. This enumeration of factors is in keeping with the thinking of the clinician who is challenged to detect the causes of infertility and to plan a method of handling. It is divided into six parts. The first provides a review of genital physiology, including the sexual cycles of the mare, cow, ewe, goat, bitch, sow, cat, and doe (rabbit). The sexual hormones, zygote, copulation, fecundation, and factors affecting male and female fertility are discussed. Part two is given over to the male; three to the female; four to sterility of infectious and parasitic origins; five, nutrition and sterility; and part six, to artificial insemination. The latter covers methods of collecting, diluting, and conserving semen. Techniques for insemination, advantages and inconveniences, genetics, and transplantation of the fertilized ovum are discussed.

It is a splendid text. The veterinarians can be deeply appreciative and justly proud of the prestige that authors of Professor Derivaux's capabilities give to the profession.—[*Physio-Pathologie de la Reproduction et Insemination Artificielle des Animaux Domestiques (in French). By J. Derivaux. 466 pages. Vigot Frères, Paris, France, 1958. No price given.*]—H. E. KINGMAN, Sr.

Veterinary Obstetrics

The well-known textbook, "Veterinary Obstetrics," written by A. O. Stoss and published in two editions (1928 and 1944), was revised by Baier and Schaetz as the third edition. It deals mainly with pregnancy, parturition, postpartum problems, and the physiology and pathology of newborn animals.

The first chapter encompasses discussions on normal pregnancy, with its influence on the female, embryological development of the fetus, and pregnancy diagnosis. Sections are devoted to pathological conditions occurring during pregnancy with respect to congenital abnormalities and those found in the placenta and amniotic fluid. Finally, this chapter also discusses induced and accidental abortions, delayed parturition, and disorders developing in the gestating female.

The second chapter is devoted to normal parturition, fetotomy, laparotomy, and pathological conditions seen at parturition of both the parturient female and fetus.

The third chapter deals with normal and pathological postpartum conditions of the genitourinary tract and placenta. This includes infections, metabolic disorders, and the physiological pathology.

The final chapter describes normal and pathological conditions found in the newborn animal.

This textbook, which utilizes latest research findings in veterinary obstetrics and associated related fields, is clearly written and supplemented with instructive illustrations. It is a splendid contribution, not only to veterinary obstetrics, but also to veterinary medicine in general. It should be an excellent text for veterinary students and for the practicing veterinarian.—[*Tierärztliche Geburtskunde. By W. Baier and F. Schaetz. 3rd ed. 316 pages; illustrated. Ferdinand Enke, Stuttgart, Germany, 1958. Price $12.00.*]—F. KRAL.

Basic Care of Experimental Animals

This 68-page booklet is a revision of the 1953 edition. Its purpose is to acquaint newcomers with the proper care of laboratory animals and it is based on the premise that both science and humanitarianism are served by keeping such animals contented and healthy.—[*Basic Care of Experimental Animals. 68 pages. Prepared by the Animal Welfare Institute, 22 East 17th St., New York 3, N. Y. 1958. Price not given.*]

THE NEWS

Dr. Mingle Reports on Veterinary Education in Italy

Dr. C. K. Mingle (OSU '30), chief, Brucellosis Section, Animal Disease Eradication Division, ARS, U.S.D.A., recently returned from Italy where he visited eight of the nine veterinary schools, spending two to three days

Dr. C. K. Mingle

at each. The school not visited, at the University of Messina in Sicily, was undergoing a reorganization program. Dr. Mingle is a member of the AVMA Council on Education and chairman of the ARS Committee on Veterinary Education.

The nine schools in Italy graduate about 250 veterinary students each year, one-third of whom are from foreign countries (mostly from Greece). The proportionately large number of schools assures small classes and affords excellent professor-student relationships. Junior-year students are required to write a thesis and are assigned to one professor who guides them until the paper is finished. Under such an arrangement, the student practically lives with the professor at the university until the work is completed.

The requirements for a veterinary degree are 13 years of preprofessional schooling and the four-year veterinary college course. Since these schools are subsidized by the government, tuition is less than $100 a year.

There are about 7,000 veterinarians in Italy, the majority of whom are employed by the state. For example, of the 350 veterinarians on the Island of Sardinia, only 50 are engaged in private practice—the others being in government positions. Private practitioners are few and cities maintain veterinary services under municipal sponsorship.

During the past three years, Dr. Mingle has also visited veterinary schools in Germany, England, Scotland, and France.

Lebanese Visitor

Dr. A. K. Antar of Beirut, Lebanon, a 1928 graduate of the Calcutta-Bengal Veterinary College, visited the AVMA offices in March.

Dr. and Mrs. Antar are on a four-month tour through Italy, Switzerland, France, Spain, Portugal, Brazil, and the United States. While here, they have seen relatives and friends in New York, Oklahoma, Iowa, and Illinois.

A native of Iraq, Dr. Antar for many years served as veterinary surgeon near the borders of

Dr. A. K. Antar signing the guest register at the reception desk in the AVMA offices in Chicago.

Saudi-Arabia, Kuwait, and a no-man's land of several thousand square miles of desert. The only inhabitants of this region are nomadic tribes, but the majority of the country's cattle, buffalo, and sheep are found here. Each spring, millions of sheep are brought there to graze. In this area, there is also a 10,000 square-mile marsh where water buffaloes roam in abundance.

During World War II, Dr. Antar served the British government, procuring approximately 10,000 camels and 20,000 mules for the military forces.

In 1952, Dr. Antar moved his family to Beirut and has since become a Lebanese citizen.

The Antars plan to return to Lebanon in May.

Colonel Rust Joins University of Chicago

Colonel John H. Rust (Ret.), V.C., U.S. Army, has been appointed head of the new section on nuclear medicine at the University of Chicago. He will assume his new position in June.

Colonel Rust (KSC '32) retired recently as chief of the veterinary pathology section and the laboratory animal branch at the Armed Forces Institute of Pathology (*see* the JOURNAL, April 1, 1959, p. 339).

Currently, Colonel Rust is in Washington, D.C., where he is completing an assignment for the Massachusetts Institute of Technology.

AMONG THE STATES AND PROVINCES

California

Officers of Southern California Association.—Dr. Howard C. Taylor (COL '42), Burbank, was installed as president of the Southern California Veterinary Medical Association for 1959, at the Association's annual installation ball on January 10. As president, he will head the largest local veterinary group in the state.

Other officers installed were: Drs. R. J. Schroeder, Downey, president-elect; R. C. Vierheller, Whittier, first vice-president; J. H. Hensley, Burbank, second vice-president; W. A. Young, Los Angeles, treasurer; and Fred P. Sattler, Fullerton, secretary.

s/H. DON MAHAN, *Executive Secretary.*

Connecticut

Fairfield County Association.—The Fairfield County V.M.A. met at the Chimney Corner Inn, Stamford, on March 11.

Dr. Donald Patterson (OKL '54) of the School of Veterinary Medicine at the University of Pennsylvania, presented a talk on "The Diagnostic and Therapeutical Aspects of Canine Cardiology."

s/GEORGE G. PICKETT, *Secretary.*

Georgia

Officers of South Georgia Association.—The following officers are currently serving the South Georgia Veterinary Medical Association: Drs. R. B. Phillips, Cordele, president; Jesse D. Derrick, Montezuma, vice-president; and M. W. Hale, Tifton, secretary-treasurer.

s/MAURICE W. HALE.

Indiana

Officers of Central Indiana V.M.A.—Officers elected at the Dec. 10, 1958, meeting of the Central Indiana V.M.A. are: Drs. Peter Johnson, Indianapolis, president; Charles Stengel, Indianapolis, president-elect; O. W. Cottongim, Southport, vice-president; and P. T. Parker, Plainfield, secretary-treasurer.

s/P. T. PARKER, *Secretary.*

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The Women's Auxiliary.—The Women's Auxiliary to the Indiana Veterinary Medical Association attended their fifteenth annual meeting in conjunction with the State Association's meeting, Jan. 14-16, 1959, at the Hotel Severin in Indianapolis.

At the business meeting, Mrs. Frank Booth, Elkhart, president-elect of the American Veterinary Medical Association Auxiliary, discussed the changes under consideration in the AVMA Auxiliary constitution.

The addition of three new regional auxiliaries within the state this year was also announced. Each regional group was asked to send a list of women who would be qualified to become state officers—in order to insure representation from each district.

Elected to serve the Auxiliary for 1959 were: Mrs. W. E. Welbourn, Winchester, president; Mrs. Howard Glass, Indianapolis, first vice-president; Mrs. M. M. Seeger, Thorntown, secretary; and Mrs. L. M. Borst, Indianapolis, treasurer.

Social events for the convention included an informal bridge party, square dance, luncheon, hat show, and the annual banquet and dance.

s/MRS. H. J. MAGRANE, JR., *Correspondent.*

The officers of the Indiana V.M.A. Auxiliary are left to right—Mrs. Larry Borst, treasurer; Mrs. Harry Koeppen, second vice-president; Mrs. W. E. Welbourn, president; Mrs. Howard Glass, first vice-president; and Mrs. M. M. Seeger, secretary.

Kansas

McLeod Memorial Fund.—A gift of $3,000 for the creation of a "W. M. McLeod Memorial Fund unit of the Kansas State College Foundation for Veterinary Medicine," will be invested by the Kansas State Endowment Association with earnings to be used for scholarships in veterinary medicine. Dr. McLeod, who died in 1957, was a member of the Kansas State staff for 38 years and served as head of the Department of Anatomy for more than a decade.

Missouri

State Association Meeting.—The sixty-seventh annual convention of the Missouri V.M.A. met at the Hotel Statler-Hilton, St. Louis, Mo., Feb. 27-28, 1959.

The following veterinarians participated in the general sessions of the two-day meeting: Drs. W. R. Sheets, Farmington—a small animal practice for the large animal practitioner; R. E. Rebrassier, Columbus, Ohio—AVMA in action; Frank R. Booth, Elkhart, Ind.—AVMA Judicial Council and ethics; Julius J. Fishler, Elkhart, Ind.—radiology—x-ray damage; and C. B. Hostetler, Des Plaines, Ill.—interprofessional relations.

Contributions to the large animal portion of the program were made by: Drs. Sam Elmer, Richland Center, Wis.—dairy cattle practice; R. O. Nesheim, Chicago, Ill.—swine production and nutrition; Forest L. Goetsch, St. Louis—vertical integration in livestock; George C. Shelton, Columbia—sheep and cattle scabies; and J. H. Gillespie, Ithaca, N. Y.—virus infections in cattle.

Drs. E. F. Ebert, Columbia, J. W. Brown, and Carl H. Horstman, both of Collinsville, Ill., served as a panel on horse and pony practices.

In the small animal sessions, participants included: Drs. John M. Gillispie, River Forest, Ill.—hospital management; J. H. Gillespie—new canine serological services; Erwin Small, Urbana, Ill.—pet birds; Kenneth Whittington, Jr., Memphis, Tenn.—eye diseases and economic aspects of practice; and Julius J. Fishler-feline practice tips.

Montana

State Association.—The current roster of the Montana V. M. A. is: Drs. H. L. Nordell, Great Falls, president; Del Gates, Lewistown, president-elect; Dave Colemey, Livingston, vice-president; and George A. Morrison, Great Falls, secretary-treasurer.

The Association's delegate to the AVMA is Dr. J. H. Newhall, Bozeman, and alternate delegate is Dr. A. F. Hayes, Billings.

Nebraska

Women's Auxiliary.—The officers of the Women's Auxiliary to the Nebraska V.M.A. for 1959 are: Mrs. N. W. Kruse, Genoa, president; Mrs. R. A. Claybaker, Chester, vice-president; and Mrs. C. B. Schwab, Fairbury, secretary-treasurer.

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Seminar on "Disease-Free Pigs."—A seminar on "disease-free pigs" was offered to interested veterinarians during February by the University of Nebraska at Lincoln. Techniques and equipment developed by the animal pathology department were demonstrated.

s/CROSBY HOWE

Ohio

Mycology Course Held.—A course in Veterinary Mycology Techniques was held April 23-25, 1959, at Ohio State University. It was sponsored jointly by the College of Veterinary Medicine and the Ohio Department of Health Service.

The course included epidemiology, laboratory techniques, and identification of various mycotic infections of animals and was limited to 30 veterinarians. Dr. John H. Helwig, Department of Preventive Medicine at Ohio State, was in charge of arrangements for the course.

Oklahoma

State Association Officers.—Newly elected officers of the Oklahoma V.M.A. are as follows: Drs. J.B. Corcoran, Stillwater, president; R.E. Henry, Pawnee, president-elect; Charles Kelsey, Lawton, vice-president; W. K. Fauks, Oklahoma City, treasurer; and W. F. Irwin, Tulsa, secretary.

s/W. F. IRWIN, *Secretary.*

Oregon

Court Upholds Brucellosis Clean-Up.—March 11, 1959, the State Supreme Court upheld the constitutionality of Oregon's Brucellosis Eradication Law, clearing the way for continuance of efforts toward a brucellosis-free state by June, 1959.

This law places responsibility for control of brucellosis, tuberculosis, and paratuberculosis (Johne's disease) in the hands of the state. A lawsuit attacking the constitutionality of the 1957 law had impeded the program's progress by challenging the right of the state to conduct the clean-up program.

Dr. Peterson Resigns as State Veterinarian.—Dr. K. J. Peterson (COL '46) resigned as Oregon state veterinarian in October, 1958, to become a member of the veterinary staff at Oregon State College. Dr. L. E. Bodenweiser succeeded him as state veterinarian (see below).

Dr. K. J. Peterson

After graduation from the College of Veterinary Medicine at Colorado State University, Dr. Peterson joined the College's faculty as an assistant professor in pathology. He taught there for one year before entering private practice in Salem, Ore., where he remained for the next six years. He then became state veterinarian in Oregon, a position he held for five and a half years.

Prior to attending Colorado State, Dr. Peterson received his B.S. degree from the University of Minnesota, taught agriculture, and was a county agricultural agent in Minnesota.

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Dr. Bodenweiser Appointed State Veterinarian.—Appointment of Dr. Lewis E. Bodenweiser as state veterinarian, effective January 1, was announced recently. He had been performing the duties of the office since October 22, following the resignation of Dr. K. J. Peterson.

Dr. Bodenweiser received his D.V.M. degree from Toronto University in 1936 as well as two other degrees in veterinary medicine from Ontario Veterinary College. He holds veterinary licenses in three states and was in private practice in Missouri for 15 years before moving to Oregon.

Dr. Lewis E. Bodenweiser

In private practice, Dr. Bodenweiser's specialty was development of breeding programs and infertility diagnosis and treatment in cattle.

Pennsylvania

Dr. Derk Appointed Administration Officer of Agriculture Department.—Dr. Miles R. Derk (UP '13), of Jersey Shore, was recently appointed by Governor Lawrence as administrative officer of the State Department of Agriculture.

A practicing veterinarian for many years and former member of the State Senate, Dr. Derk will be responsible for professional relations pertaining to veterinary service and public health.

Since establishing his practice in Jersey Shore in 1913, Dr. Derk has been active in business and civic affairs in his community and county. During World War II, he was a member of the local draft board and also served as health officer for 15 years; he was also burgess of the town for eight years.—*Weekly News Bulletin (March 19, 1959), Pennsylvania Department of Agriculture.*

Virginia

Association Adopts Constitution.—Meeting informally, the Central Virginia Veterinary Association adopted a constitution and by-laws in September, 1958.

The Association's roster includes: Drs. Carl E. Boyd, Richmond, president; H. Q. Tucker, Jr., Orange, vice-president; and Edwin M. Crawford, Richmond, secretary-treasurer.

s/EDWIN M. CRAWFORD, *Secretary.*

Washington

Dr. Crouse Retires as State Veterinarian.—After 18 years of service, Dr. Arthur E. Crouse (KCV '11) retired as state veterinarian for Washington on June 30, 1958. Dr. Roy I. Hostetler succeeded him on November 15 (see below).

Dr. Arthur E. Crouse

In 1952, Dr. Crouse became supervisor of the Animal Industry Division, then known as the Dairy and Livestock Division. He directed the state's veterinary forces in the accelerated brucellosis program through which Washington, in 1956, became one of the first states to achieve the brucellosis-free status.

Dr. Crouse left private practice in 1935 to become a field veterinarian for the Animal Disease Eradication Division of the U. S. Agricultural Research Service. He joined the Washington State Department of Agriculture's veterinary staff in 1940.

Continuing to make his home in Olympia, Dr. Crouse devotes much of his time to two of his favorite hobbies, hunting and fishing.

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Dr. Hostetler Appointed State Veterinarian.—Becoming supervisor of the State Department of Agriculture's Division of Animal Industry in Washington on Nov. 15, 1958, Dr. Hostetler replaced Dr. Roscoe Balch, who had been acting supervisor of the division since Dr. Crouse's retirement, June 30, 1958. Dr. Balch then returned to his previous position as supervisor of the state's poultry diagnostic laboratory at the Western Washington Experiment Station in Puyallup.

Born on a farm near Asotin, Dr. Hostetler graduated from the College of Veterinary Medicine, State College of Washington, in 1939. He then spent three years with the BAI in Oregon and served four years in the U.S. Army during World War II.

Dr. Roy I. Hostetler

Engaged in private practice in Goldendale since 1946, Dr. Hostetler has also served as Klickitat County sanitarian. He was president of the Washington State V.M.A. in 1955 and was recently chosen representative from the Yakima V.M.A. to the State Association.

West Virginia

State Association Meeting.—The winter meeting of the West Virginia V. M. A. was held at the Greenbrier Hotel in White Sulphur Springs, Feb. 8-9, 1959.

At the business meeting, several legislative matters were discussed: bills amending the veterinary practice act, a meat inspection bill, and a bill banning the use of live virus hog cholera

Officers of the West Virginia V.M.A. for 1958-1959. Front row, left to right—Drs. Harry J. Fallon, secretary-treasurer; John J. Spanabel, president; William E. Trussell, president-elect.
Back row, left to right—Drs. James R. Moore, Jr., and J. O. Heishman, members of the executive board.

vaccine, except with the written permission of the state veterinarian (Dept. of Agriculture).

The scientific program included talks by the following: Drs. Victor Thomas, Richmond, Va. —small animal practice; George Burch, Indianapolis, Ind.—clinical research; Charles W. Raker, Philadelphia, Pa.—newer concepts in management of carpitis in the horse; Graham Ward, Charlestown, W. Va.—aspects of veterinary medicine in Australia; and V. L. Tharp, Columbus, Ohio—bovine sterility.

Officers of the Association are: Drs. J. J. Spanabel, Fairmont, president; W. E. Trussell, Charles Town, president-elect; H. J. Fallon, 200 Fifth St., West Huntington, secretary-treasurer.

s/H. J. FALLON, *Secretary.*

Wisconsin

State Association.—The forty-third annual meeting of the Wisconsin V. M. A. was held Jan. 18-20, 1959, in Milwaukee.

The Association voted to accept the invitation of the Wisconsin Retail Feed Dealers to attend a joint two-day meeting of the two groups in August. A joint session of the feed dealer's executive committee and the nutrition committee of the Wisconsin V. M. A. was held during the convention.

The following officers were elected: Drs. Burr W. Nussdorfer, Sparta, president; Frank Gentile, Milwaukee, vice-president; W. L. Richards, Columbus, treasurer; and W. J. O'Rourke, Madison, public relations secretary.

s/W. J. O'ROURKE, *Public Relations Secretary.*

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Dr. Bristol Receives Veterinarian of the Year Award.—Dr. R. F. Bristol (MSC '51), of

Dr. R. F. Bristol

Montford, was named Wisconsin's veterinarian of the year and awarded a plaque at the winter banquet meeting of the Wisconsin V.M.A. held in January at the Schroeder Hotel in Milwaukee.

Dr. Bristol has participated extensively in association activities. He has served on the public relations committee of the Wisconsin V.M.A. (1958) and as president of the Southwestern Wisconsin V.M.A.; also as director of the successful rabies control program and as chairman of the second annual clinic conference for his local association.

In addition, he was active in community affairs, a pioneer patron of Platteville State College, a member of the Montfort Board of Education, and a member of the steering and building committees of a newly formed school district.

Previous recipients of the award were: Drs. Sam Elmer (ISC '34), Rolland Anderson (COL '35), H. J. O'Connell (MCK '18), and S. H. McNutt (ISC '17).

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Women's Auxiliary.—The Women's Auxiliary to the Southeastern Wisconsin V. M. A. have elected the following roster: Mrs. Daniel Paradee, Hustisford, president; Mrs. Clifford T. Orton, Beaver Dam, vice-president; and Mrs. Lawrence J. Algiers, Hartford, secretary-treasurer.

During the past year, the Auxiliary has contributed to the student loan fund, memorial fund, and the research fund.

s/MARY JANE PARADEE, *President.*

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Milwaukee Association.—Newly elected officers for the Milwaukee V. M. A. are as follows: Drs. J. M. Watts, Kenosha, president; Gilbert Lewis, Menomonee Falls, vice-president; Jordan Lewis, Menomonee Falls, secretary-treasurer.

s/JORDAN LEWIS, *Secretary.*

FOREIGN NEWS

Italy

Varese Avicultural Shows.—The *Giornate Avicole Varesine* (Varese Avicultural Shows) will be held in Varese, northwest of Milan, in Lombardy, from May 29 to June 2, 1959.

On May 29, a symposium is scheduled for the benefit of avicultural technicians from Europe, the Mediterranean area, Canada, and the United States. The purpose of the meeting is to encourage an exchange of views on the following subjects: purebreeding, crossbreeding, and feeding of birds; sanitary measures; and domestic and international markets for avicultural products. Interpreters will translate all the talks into English and French.

On May 30, Prof. Telesforo Bonadonna, of the University of Milan, will be chairman of a meeting of the Italian Society for the Progress of Zootechnics.

STATE BOARD EXAMINATIONS

FLORIDA—June 15-17, 1959, Biscayne Terrace Hotel, Miami. Address all inquiries to Dr. E. L. Matthews, Secretary of the Board of Veterinary Examiners, Box 141, Palatka, Fla. Deadline for acceptance of applications will be June 1, 1959.

IOWA—June 1-2, 1959, Office of the Division of Animals Industry, State House, Des Moines, Iowa, not later than 8 o'clock on the morning of June 1. Further information may be obtained from Dr. A. L. Sundberg, Chief, Division of Animal Industry, State House, Des Moines 19, Iowa.

KENTUCKY—June 17, 1959, State Capitol Building, Frankfort, Ky. Jack E. Winkler, Secretary-Treasurer, Kentucky Board of Veterinary Examiners, 319 Ann St., Frankfort, Ky.

MARYLAND—June 8-9, 1959, College Park, at 8:00 a.m. Applications must be returned to the secretary, no later than June 1. Dr. Harold S. Gober, 5400 Park Heights Ave., Baltimore 15, Md., secretary-treasurer.

MASSACHUSETTS—June 25-27, 1959, University of Massachusetts, Amherst. Address inquiries to Dr. Edward A. Blake, Secretary, Board of Registration in Veterinary Medicine, Room 33, State House, Boston 33, Mass.

MICHIGAN—June 12-13, 1959, Lansing, Mich. These will be written, practical, and oral examinations. Applications must be on file at least 15 days before the exam, accompanied by the $25 fee. Address: State Veterinarian, 641 Lewis Cass Building, Lansing 13, Mich., John F. Quinn, corresponding secretary.

MISSOURI—June 5-6, 1959, Veterinary Clinic, University of Missouri, Columbia. Application blanks may be obtained from Dr. L. A. Rosner, Board Chairman, Box 630, Jefferson City, Mo.

MONTANA—June 22-24, 1959, Montana Veterinary Research Laboratory, Montana State College, Bozeman, Mont. For application blanks, write: Dr. J. W. Safford, Secretary-Treasurer, State Board of Veterinary Medical Examiners, Capitol Station, Helena, Mont.

NORTH CAROLINA—June 22-24, 1959, Morehead Biltmore Hotel, Morehead City, N. Car. Dr. James I. Cornwell, Secretary-Treasurer, North Carolina State Veterinary Examining Board, 65 Beverly Rd., Beverly Hills, Asheville, N. Car.

OHIO—June 8-10, 1959, Sisson Hall, College of Veterinary Medicine, Ohio State University, Columbus, Ohio. Applicants must be present at 8 a. m. on the first day. Application forms may be obtained from the office of the Executive Secretary, Ohio Veterinary Medical Board, Room 720, Ohio Departments Building, Columbus 15. All application forms must be returned to the Secretary not later than May 4, 1959. Dr. H. G. Geyer, executive secretary.

OREGON—June 15-17, 1959, Hotel Multnomah, Portland. Dr. C. R. Howarth, Secretary, Oregon State Veterinary Medical Examining Board, 135 N. Highway, St. Helens, Ore.

SOUTH DAKOTA—June 22-23, 1959, Brookings. Applications should be sent to Office of Livestock Sanitary Board, Pierre, S. Dak., Dr. M. D. Mitchell, state veterinarian.

TEXAS—Next licensing examination will be held June 1-3, 1959, A. & M. College of Texas, College Station. The completed application must be received in the Board office not later than 30 days before the examination date. Applications should be sent to Mr. T. D. Weaver, 207 Capital National Bank Building, Austin 16, executive secretary, State Board of Veterinary Medical Examiners.

UTAH—June 11-12, 1959, Utah State Capitol Building, Salt Lake City, Utah. Dr. Wayne Binns, Chairman, Utah Veterinary Examining Board, 555 North Third East, Logan, Utah.

WEST VIRGINIA—June 15, 1959, Capitol Building, Room 117, Charleston. For information and application forms, write: Dr. Harry J. Fallon, 200 Fifth St. West, Huntington, W. Va., secretary-treasurer.

WISCONSIN—June 29-30, 1959, Madison, Wis. A. A. Erdmann, 6 West St., State Capitol, Madison 2, Wis.

WYOMING—June 18, 19, 1959, State Capitol, Cheyenne. For further details write Dr. G. H. Good, 304 Capitol Bldg., Cheyenne, Wyo., secretary.

DEATHS

Star indicates member of AVMA

A. B. Bruton, 92, died Jan. 14, 1959, in a hospital in Shreveport, La. For a number of years, Dr. Bruton had practiced in Haynesville, La.

★**Jerrold Cole** (CAL '54), 30, Visalia, Calif., was killed instantly in a head-on collision, Feb. 6, 1959, near Lemon Grove, Calif., on Highway 198.

Since 1956, Dr. Cole had engaged in a private dairy practice in Visalia. Prior to this, he had served in the Army Veterinary Corps for two years.

Dr. Cole was secretary of the Tulare County V.M.A.

★**John H. Collins** (OSU '35), 46, Washington, D.C., veterinary medical director of the

Dr. John H. Collins

Food and Drug Administration, H.E.W., died of a heart attack on March 29, 1959.

A native of Columbus, Ohio, Dr. Collins served with the U. S. Department of Agri-

culture for seven years following graduation, then entered the Food and Drug Administration in 1942 as an assistant veterinarian. He carried on research at the FDA laboratories in Beltsville until assigned to the administrative headquarters in 1946.

Dr. Collins was made veterinary medical director in 1953 and chief of the veterinary medical branch of the agency's Bureau of Medicine. In addition, he was the author of many scientific, technical papers and developed a standard method, still employed, for testing the efficacy of poultry coccidiostats.

He was a member of the AVMA Council on Biological and Therapeutic Agents.

★**Milton H. Covert** (COR '38), 42, city veterinarian of Rochester, N. Y., died of coronary thrombosis on June 6, 1958. After graduation, Dr. Covert began his practice at Webber Brothers Hospital, Inc., at Rochester. Ten years later, he joined the city health department.

As consultant for the University of Michigan, School of Public Health, he helped plan the First National Institute of Veterinary Public Health Practice in 1957. As a veterinary consultant to the R. T. French Co., Dr. Covert was engaged in studying the nutritional problems and diseases of caged birds. He had developed new surgical techniques and recently completed a study on anesthetics for caged birds.

In addition, Dr. Covert was a consultant to the New York State Department of Health, president of the Western New York V.M.A., a past-president of both the New York State Public Health Veterinarians Association and the Monroe County V.M.A., as well as a member of the New York State V.M.S.

A member of the executive committee of the Rochester Humane Society, Dr. Covert was currently working on sanitation for the new animal shelter to be built by the Society. This May, the Rochester and Monroe County Humane Societies are dedicating a new building to be called the "Dr. Milton H. Covert Memorial Shelter," built from funds contributed by his friends around Rochester and in other parts of the country. The Shelter will house stray dogs and cats.

Kenneth W. Davis (COR '34), 53, died Dec. 16, 1958, in his home in West Winfield, N.Y. He had retired 11 years ago to operate a farm.

Adam Wiley, 78, Walden, N.Y., died Dec. 19, 1958. Dr. Wiley was a general practitioner.

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Other Deaths Reported.—The following deaths have been reported. The usual information for an obituary was not supplied.

Lester H. Allen (MCK '08), Albany, Wis., died Jan. 23, 1959.

Ralph E. Christopher (MCK '07), 78, Dysart, Iowa, died Jan. 24, 1959.

Morton E. Coyle, 62, Durham, N.Car., died Jan. 19, 1959.

John H. Crawford (MCK '97), 83, Hinckley, Ill., died Jan. 29, 1959.

Virgil B. Jones (TEX '40), 44, Houston, Texas, died Jan. 12, 1959.

R. F. Meiners (NYA '00), Sunset Lake, Pluckemin, N.J., died in Tucson, Ariz., Jan. 13, 1959.

Angus C. Mincey, Jr. (GA '52), Ogeechee, Ga., died Jan. 17, 1959.

Herbert L. Smith (ISC '19), 64, Panora, Iowa, died February 27, 1959.

Frank J. Trafton (MCK '05), Long Beach, Calif., died Jan. 16, 1959.

Peter F. Trainor (NYU '07), 74, Ramsey, N.J., died Jan. 17, 1959.

Hiram L. Tate (OSN '11), 74, Leesburg, Fla., died Jan. 17, 1959.

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by Margaret Schlichting. *Vet. Med.*, 51: 280 (June) 1956.

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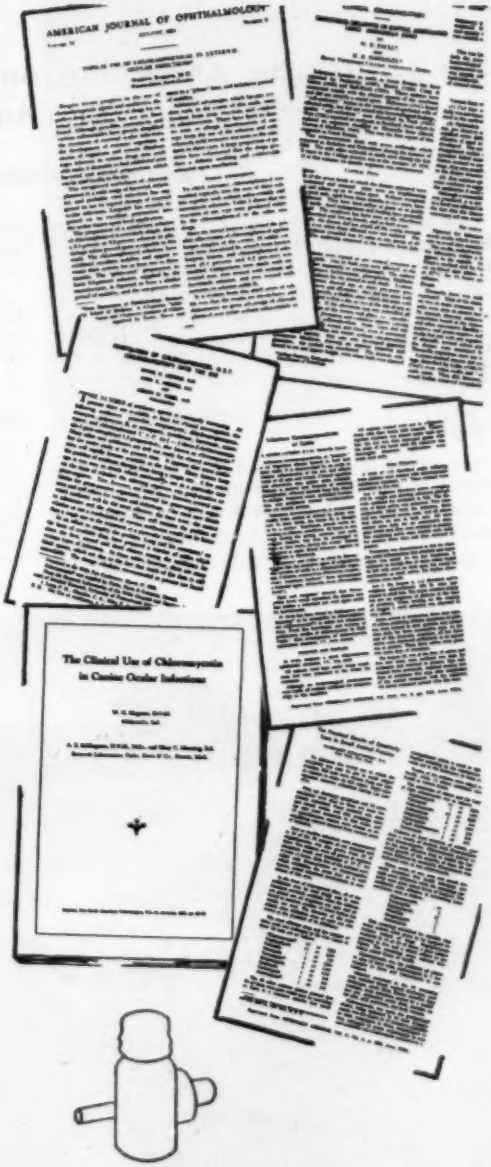
INFECTIOUS KERATITIS IN CATTLE, ASSOCIATED WITH MORAXELLA BOVIS
by W. B. Faull and M. B. Hawksley. *Vet. Rec.*, 66: 311 (May 29) 1954.



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Kansas City, August 24-27

Vacation Opportunities

Rich in story, home of great men in many walks of life, and blessed with varied terrain, Missouri is an "opportunity" state for vacationers.

While historic points of interest are scattered around the state, vacation spots for fishing, loafing, boating, floating, swimming, and horseback riding are centralized in the Missouri Ozarks and White River Country south of the Missouri River.

Fishing

Missouri has a year-round open season for all species except smallmouthed bass. Persons 17 years or older must have a fishing permit. A nonresident trip fishing permit costs $3.25 and is good for 14 days. Permits may be obtained from any county clerk, or from subagents located in sporting goods stores, fishing docks, and other places of business in resort areas.

Fishing conditions in the state are so varied that the angler can either "rough it" in the wilds, sleeping on gravel bars, or he can fish from a high-powered cruiser while spending the night at one of the many Missouri resort areas.

Float Fishing

This sport, which originated in Missouri at the turn of the century, is popular with fishing parties. A fisherman can float along one of the 25 popular floating streams anywhere from half a day to two weeks. Commercial guides are available to do all the paddling, camp-making, and cooking.

Floating streams are all cold and clear, curving and bent back upon themselves. Rapids and "white water" give way to long deep pools, and rock cliffs are succeeded by gently sloping gravel bars. The changing character of the streams challenges the fisherman and entices a variety of species to make their homes in the most compatible portion of the stream.

The trout is not a fish native to Missouri, but the state has stocked many streams for the benefit of sportsmen. Bass is the usual game fish, with both bigmouthed and smallmouthed bass abounding.

North of the Missouri River, the rivers are chiefly noted for cat fishing, with crappie and sunfish also plentiful. The upper portion of the Salt River in northern Missouri offers some good bass and drum fishing, comparable to the fishing south of the Missouri.

State-operated hatcheries stock catchable-sized rainbow trout at Bennett Springs, Roaring River, and Maramec Springs state parks.

Horseback riding is a favorite sport of teenagers. Saddle horses are available at Lake of the Ozarks, Maramec, Roaring River, and Sam A. Baker state parks.

Other Types of Vacations

Mountainous areas of the Ozarks, plains country, delta land, and rolling hill and prairie country combine to provide attractive vacation features in Missouri.

Caves, mighty springs, huge forested areas, sprawling lakes, and swift-running streams provide variety in sightseeing. Twenty-nine operating state parks provide reasonable accommodations for visitors in or near the outstanding attractions.

In addition, golf courses, tennis and badminton courts, swimming pools, bowling alleys, and picnic grounds are scattered throughout the state and around Kansas City.

Additional vacation information will be carried in future issues of the JOURNAL, and specific information can be obtained from the Missouri Division of Resources and Development, Jefferson Building, Jefferson City, Mo.

Some fishermen don't feel that they have fished unless they can go after trout. The trout is not native to Missouri, but the state has stocked rainbows at Bennett Springs, Roaring River, and Maramec Springs.

Float fishing in Missouri calls for a landfall at mealtimes to prepare and eat the catch. Guides can be obtained to paddle, make camp, and cook.

—Photos courtesy Massie-Missouri Resources Division

WOMEN'S AUXILIARY

President—Mrs. E. A. Woelffer, 115 Woodland Lane, Oconomowoc, Wis.
Secretary—Mrs. A. W. Eivers, 1745 S. 13th St., Salem, Ore.

The New Constitution

At the Philadelphia meeting, the Constitution Revisions Committee presented a new constitution to the House of Representatives of the Women's Auxiliary to the AVMA. Complete revision was deemed necessary by the AVMA because we are an Auxiliary *to* the American Veterinary Medical Association, and as such, our constitution should follow that of the parent association very closely in form and content. The proposed revisions were suggested in order to achieve this goal.

The most important change is in the selection of members for the House of Delegates. Under the new constitution, each constituent auxiliary, state or provincial, will have a *delegation* based on national membership (one delegate for every 50 national members), made up of at least one member and not more than seven. Thus, a state or provincial auxiliary with 60 national members will have two delegates; one with 500 will have seven.

As in the AVMA, it is recognized that the activities and spirit of the local and district organizations are vital to our national auxiliary. However, these organizations need to be part of and affiliated with their own state or provincial organizations. On most executive boards of state veterinary associations, there is representation from each organized group within the state; a few auxiliaries (Illinois, Missouri and Washington) have similar boards. It is hoped that each constituent auxiliary will eventually adopt this system of representation on their executive boards, and will have representatives from each section serving as members of the constitutent delegation.

The method of the selection of the delegation is a matter for each constituent auxiliary to consider. The constitutions of most auxiliaries will need to be amended in order to provide for the selection of a delegation, rather than that of the single delegate which their constitutions now provide.

It will take time to get the mechanics of these changes to function well, but with the cooperation and understanding of all the membership, this should proceed smoothly.

The new constitution calls for an expanded Executive Board with five vice-presidents instead of three. Some of the duties of the officers have been changed to equalize the work load. Progression of vice-presidents has been eliminated. It is felt that seven years on the Executive Board is more time than most women can be expected to give. At times we have been deprived of the services of very capable women because they have been unable to serve for this long period of time. The editor of the *Auxiliary News,* formerly appointed, and the chairman of the Public Relations Committee, will attain officer status as vice-presidents. Such changes will enable us to coordinate the work of the Auxiliary more successfully.

The revised constitution, approved by the executives of the AVMA, was read and discussed at the Philadelphia meeting. Its adoption will be voted upon at the Kansas City meeting in August.

s/Mrs. (Frank R.) Leonore M. Booth,
President-Elect

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STUDENT CHAPTER ACTIVITIES

University of Pennsylvania Student Chapter

New student chapter officers elected for the 1959 spring term are as follows: Jay Badgley, president; Edward Mikas, president-elect; Edwin Jeszenka, secretary; and Dick Smalley, treasurer. Dr. John Martin serves as faculty advisor.

Class representatives for the spring term are: George Heisey, senior class; Carl Reynolds, junior class, Edwin Jeszenka, representing the sophomores; and Fred Troutt, freshman class.

During the fall meetings, guest speakers on the program discussed the "History of Veterinary Medicine," Congenital Hip Dysplasia in the Dog," "Heartworm Disease in Dogs," and "Equine Surgery."

At the September meeting, Dr. Mark W. Allam, dean of the Veterinary School at the University, presented the class awards. Bob Eberhart was awarded the Anatomy Prize, Class of 1926 and the Borden Award. The Class of 1914 Freshman Prize was won by Oliver Ginther, and Ralph Brinster was presented with the Goldhalf Prize.

During the fall term, an amendment to the constitution was proposed which would make juniors elegible to hold the office of president.

COMING MEETINGS

Notices of coming meetings must be received 30 days before date of publication.

Wisconsin Veterinary Medical Association. Regional conference on nitrofurans. Hotel Loraine, Madison, Wis., May 28, 1959. For information, contact Dr. H. J. O'Connell, Wisconsin V.M.A., 1215 Vilas Ave., Madison 5, Wis.

Kansas Veterinary Medical Association. Twenty-first annual conference. School of Veterinary Medicine, Kansas State College, Manhattan, May 31 (evening) to June 2, 1959. M. W. Osburn, 1525 Humboldt, Manhattan, secretary-treasurer.

Texas, A. & M. College of. Twelfth annual conference. School of Veterinary Medicine, A. & M. College of Texas, College Station, June 4-5, 1959. R. D. Turk, chairman.

Georgia Veterinary Medical Association. Annual meeting. Jekyll Hotel, Jekyll Island, Ga., June 15-16, 1959. A M. Mills, 325 Pinecrest Dr., Athens, Ga., secretary.

Ohio State University. Annual spring conference. College of Veterinary Medicine, Ohio State University, Columbus, June 16-17, 1959.

Illinois, University of. Fourth Biennial Symposium on Animal Reproduction. University of Illinois, Urbana, June 18-20, 1959. Address P. J. Dziuk, 111 Animal Genetics, University of Illinois, Urbana, for further information.

South Carolina Association of Veterinarians. Annual summer meeting. Clemson House, Clemson, S. Car., June 18-20, 1959. B. C. McLean, 808 Linden St., Aiken, S. Car., program chairman.

California Veterinary Medical Association. Seventy-first annual meeting. Miramar Hotel, Santa Monica, Calif., June 21-25, 1959. Chas. S. Travers, 3004 16th St., San Francisco, executive secretary.

Maritime Veterinary Associations, joint conference. Mount Allison University, Sackville, New Brunswick, June 23-25, 1959. P. D. McKercher, Box 310, Sackville, general chairman.

North Carolina Veterinary Medical Association. Fifty-eighth annual summer meeting. Morehead Biltmore Hotel, Morehead City, June 23-25, 1959. J. T. Dixon, secretary-treasurer.

Maryland State Veterinary Medical Association. Summer meeting. George Washington Hotel, Ocean City, Maryland, June 25-26, 1959. Harry L. Schultz, Jr., Baltimore, Md., secretary-treasurer.

Nebraska Veterinary Medical Association. Summer meeting. Pawnee Hotel, North Platte, Neb., July 10-12, 1959. H. E. Hedlund, Wahoo, Neb., program chairman.

Kentucky Veterinary Medical Association. Forty-eighth annual convention. Sheraton-Seelbach Hotel, Louisville, Ky., July 13-14, 1959. L. S. Shirrell, 545 East Main St., Frankfort, secretary.

Iowa State College. Annual conference. Iowa State College, Ames, July 14-15, 1959. C. D. Lee, chairman.

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Alabama Polytechnic Institute. Fifty-second annual conference. School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, July 19-22, 1959. J. E. Greene, dean.

American Association of Veterinary Bacteriologists. Annual meeting. Division of Veterinary Medicine, Iowa State College, Ames, Iowa, Aug. 22, 1959. C. H. Cunningham, Michigan State University, College of Veterinary Medicine, East Lansing, secretary.

Ninety-Sixth Annual Meeting, American Veterinary Medical Association, and Third Pan American Congress of Veterinary Medicine. Joint meeting. Kansas City, Mo., Aug. 23-27, 1959. H. E. Kingman, Jr., executive-secretary, AVMA, 600 S. Michigan Ave., Chicago 5, Ill. B. D. Blood, secretary-general, Directing Council, Pan American Congress of Veterinary Medicine, P.O. Box 99, Azul, F.C.N.G.R., Argentina, S.A.

New Mexico Veterinary Medical Association. Annual meeting, Western Skies Hotel, Albuquerque, N. M., Sept. 21-22, 1959. E. R. Leslie, 907 Alamosa, Carlsbad, N.M., secretary.

Foreign Meetings

Veterinary Symposium in Israel (with International Farmers Convention); Veterinary Institute, Beit-Dagan, Israel, May 10-12, 1959. Dr. A. Kimron, Veterinary Institute, director. (Particulars are also obtainable from Dr. H. E. Newman, American Veterinarians for Israel, Box 145, Merrifield, Va.

International Veterinary Congress. Sixteenth session. Madrid, Spain, May 21-27, 1959. Prof. Pedro Carda A., general secretary, Calle Villanueva 11, Madrid.

U.S. COMMITTEE: Dr. W. A. Hagan, chairman, New York State Veterinary College, Ithaca, N. Y.; Dr. J. G. Hardenbergh, secretary, 600 S. Michigan Ave., Chicago 5, Ill.

Third World Congress on Fertility and Sterility. Amsterdam, Holland, June 7-13, 1959. Dr. L. I. Swaab, Sint Agnietenstraat 4, Amsterdam, Holland, honorary secretary.

Regularly Scheduled Meetings

ALABAMA—Central Alabama Veterinary Medical Association, the first Thursday of each month. James L. Chambers, 4307 Normanbridge Rd., Montgomery, Ala., secretary-treasurer.

Jefferson County Veterinary Medical Association, the second Thursday of each month. Dan P. Griswold, Jr., 714 S. 39th St., Birmingham, secretary.

Mobile-Baldwin Counties Veterinary Medical Association, the third Tuesday of each month. W. David Gross, 771 Holcombe Ave., Mobile, Ala., secretary.

North Alabama Veterinary Medical Association, the second Thursday of November, January, March, May, July, and September, in Decatur, Ala. Ray A. Ashwander, P.O. Box 1767, Decatur, Ala., secretary.

Northeast Alabama Veterinary Medical Association, the second Tuesday of every other month. Leonard J. Hill, P.O. Box 761, Gadsden, Ala., secretary-treasurer.

ARIZONA—Central Arizona Veterinary Medical Association, the second Tuesday of each month. J. W. Langley, Jr., P.O. Box 5013, Phoenix, Ariz., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. Gwyn Chapin, 2215 E. Calle Vista, Tuscon, Ariz., secretary.

ARKANSAS—Pulaski County Veterinary Medical Society, the second Tuesday of each month. Harvie R. Ellis, 54 Belmont Drive, Little Rock, Ark., secretary-treasurer.

CALIFORNIA—Alameda-Contra Costa Veterinary Medical Association, the fourth Wednesday of Jan., March, May,

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Laminitis in horses and cattle

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Dosage: See CIBA Veterinary Therapeutic Index.

*Chambers, E. E.: N. Am. Vet. 37:105 (Feb.) 1956.

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June, Aug., Oct., and Nov. John S. Blackard, 420 Appian Way, Richmond, Calif., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of February, April, July, September, and December. Herb Warren, 3004 16th St., San Francisco, Calif., executive secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Paul S. Chaffee, 2333 McKinley Ave., Fresno, Calif., secretary.

Humboldt-Del Norte Counties Veterinary Medical Association, the second Tuesday of January, May, September, and November. Dr. C. A. Lamb, 2835 Dolbeer St., Eureka, Calif., secretary.

Kern County Veterinary Medical Association, the first Thursday evening of the month. James L. Frederickson, 17 Nile St., Bakersfield, Calif., secretary-treasurer.

Mid-Coast Veterinary Medical Association, the first Thursday of each month. William P. Matulich, P. O. Box 121, San Luis Obispo, Calif., secretary-treasurer.

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Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. V. Todorovic, 47 Mann Ave., Watsonville, Calif., secretary.

Northern California Association of Veterinarians, the second Tuesday of the month. Andrew F. Giambroni, P.O. Box 782, Red Bluff, Calif., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month at the Hotel Covell, in Modesto, Calif. T. J. Carleton, 325 W. Lockeford St., Lodi, Calif., secretary-treasurer.

Orange Belt Veterinary Medical Association, the second Monday of each month. R. Y. Foos, P.O. Box 955, Victorville, Calif., secretary-treasurer.

Orange County Veterinary Medical Association, the third Thursday of each month. H. M. Stanton, 1122 S.E. U.S. Highway 101, Tustin, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of the month. R. M. Grandfield, 416 Stephens Rd., San Mateo, Calif., secretary-treasurer.

Redwood Empire Veterinary Medical Association, the third Thursday of the month. R. R. Rediske, 833 Vallejo Ave., Novato, Calif., secretary-treasurer.

Sacramento Valley Veterinary Medical Association, the second Wednesday of the month. E. C. Story, 4819 "V" St., Sacramento 17, Calif., secretary-treasurer.

San Diego County Veterinary Medical Association, the fourth Tuesday of the month. Robert F. Burns, 7572 North Ave., Lemon Grove, Calif., secretary-treasurer.

San Fernando Valley Chapter SCVMA, the second Tuesday of each month at 7:30 p.m., Hody's Restaurant, North Hollywood, Calif. Dr. V. H. Austin, 14951 Oxnard St., Van Nuys, secretary-treasurer.

San Fernando Valley Veterinary Medical Association, the second Friday of each month at the Casa Escobar Restaurant in Studio City. John Chudacoff, 7912 Sepulveda Blvd., Van Nuys, Calif., secretary.

Santa Barbara-Ventura Counties Veterinary Medical Association, every three months, no set date. Gerald M. Clark, 5415 8th St., Carpinteria, Calif., secretary-treasurer.

Santa Clara Valley Veterinary Medical Association, the last Tuesday of the month. Robert L. King, 1269 Grant St., Santa Clara, Calif., secretary-treasurer.

Southern California Veterinary Medical Association, the third Wednesday of the month. Mr. Don Mahan, 1919 Wilshire Blvd., Los Angeles 57, Calif., executive secretary.

COLORADO—Denver Area Veterinary Medical Society, the fourth Tuesday of every month. Gene M. Bierhaus, 2896 S. Federal Blvd., Englewood, Colo., secretary-treasurer.

Northern Colorado Veterinary Medical Society, the first Wednesday of each month, in Fort Collins. Dr. James Voss, Veterinary Hospital, Colorado State University, Fort Collins, Colo., secretary.

DELAWARE—New Castle County Veterinary Medical Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. A. P. Mayer, Jr., R.F.D. 2, Newark, Del., secretary-treasurer.

DISTRICT OF COLUMBIA—District of Columbia Veterinary Medical Association, the second Tuesday evenings of January, March, May, and October. R. B. Gochenour, 10109 Ashwood Dr., Kensington, Md., secretary-treasurer.

FLORIDA—Big Bend Veterinary Medical Association, meets the first Sunday of each month at 5:00 p. m., at the Tallahassee Dining Room, Tallahassee. C. Paul Vickers, P.O. Box 309, Tallahassee, secretary.

Central Florida Veterinary Medical Association, the first Friday of each month at 8:00 p. m., place specified

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*Belloff, G. B.: Calif. Vet. 9:16 (Nov.-Dec.) 1955.

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monthly. L. R. Poe, 753 W. Fairbanks Ave., Winter Park, Fla., secretary-treasurer.

Florida West Coast Veterinary Medical Association, the second Wednesday of each month at the Lighthouse Inn, St. Petersburg. Fred Jones, 3606 S. Dale Mabry, Tampa, Fla., secretary.

Jacksonville Veterinary Medical Association, the first Thursday of every month. Dodson's Restaurant, Stephen C. Hite, 5807 105th St., Jacksonville 10, Fla., secretary.

Northwest Florida Veterinary Medical Society, third Wednesday of each month, time and place specified monthly. John Webb, P.O. Box 183, Cantonment, Fla., secretary-treasurer.

Palm Beach Veterinary Society, the last Thursday of each month in the county office building at 810 Datura St., West Palm Beach. B. W. Bigger, 2833 S. 4th St., Fort Pierce, Fla., secretary.

Ridge Veterinary Medical Association, the fourth Thursday of each month in Bartow, Fla. John S. Haromy, Route #1, Box 107-A, Lake Wales, Fla., secretary.

South Florida Veterinary Society, the third Wednesday of each month. Time and place specified monthly. Joe B. O'Quinn, 1690 E. 4th, Hialeah, Fla., secretary.

Suwannee Valley Veterinary Association, the fourth Tuesday of each month, Hotel Thomas, Gainesville. G. L. Burch, P.O. Box 405, Ocala, Fla., secretary-treasurer.

Volusia County Veterinary Medical Association, the fourth Thursday of each month. Robert E. Cope, 127 E. Mason, Daytona Beach, Fla., secretary.

GEORGIA—Atlanta Veterinary Medical Society, the third Thursday of each month at the Elk's Home, 726 Peachtree St., Atlanta. Clare L. Bromley, 634 Northside Dr., N.W., Atlanta, Ga., secretary.

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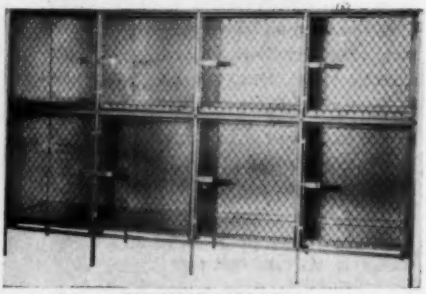

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Georgia-Carolina Veterinary Medical Association, the second Monday of each month at 8:00 p.m., at the Town Tavern, Augusta, Ga. J. A. Schmitz, 1711 Gwinnett St., Augusta, Ga., secretary.

North Georgia Veterinary Medical Association, quarterly, no set date, the spring meeting at the Veterinary School, Athens, Ga. S. J. Shirley, Commerce, Ga., secretary.

Southeast Georgia Veterinary Medical Association, quarterly, date and meeting place varies. Hugh F. Arundel, P.O. Box 153, Statesboro, Ga., secretary.

South Georgia Veterinary Medical Association, the second Sunday of each quarter at 3:30 p.m., at the Radium Springs Hotel, Albany, Ga. M. W. Hale, Route 2, Tifton, Ga., secretary.

ILLINOIS—Central Illinois Veterinary Medical Association, June 9, Sept. 9, and Dec. 10, 1959. Paul B. Doby, 4 Owens Lane, Springfield, secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month, Charles H. Armstrong, 1021 Davis St., Evanston, secretary.

INDIANA—Central Indiana Veterinary Medical Association, the second Wednesday of each month. P. T. Parker, 224 N. Mill St., secretary-treasurer.

Michiana Veterinary Medical Association, the second Thursday of every month except July and December, at the Hotel LaSalle, South Bend, Ind. Stanton Williamson, 217 W. Chippewa St., South Bend, Ind., secretary.

Tenth District Veterinary Medical Association, the third Thursday of each month. J. S. Baker, P.O. Box 52, Pendleton, Ind., secretary.

IOWA—Cedar Valley Veterinary Medical Association, the second Monday of each month, except January, July, August, and October in Black's Tea Room, Waterloo, Iowa. A. J. Cotten, P.O. Box 183, Grundy Center, secretary.

Central Iowa Veterinary Medical Association, the third Monday of each month except June, July, and August at 6:30 p.m., Breeze House, Ankeny, Iowa. S. L. Hendricks, secretary-treasurer .

Central Iowa Veterinary Medical Association, the third Monday of each month, except June, July, and August, at 6:30 p.m., Breeze House, Ankeny, Iowa. John Herrick, 202 S. Hazel Ave., Ames, secretary.

Coon Valley Veterinary Medical Association, the second Wednesday of each month, September through May, at 7:30 p.m., Cobblestone Inn, Storm Lake, Iowa. Robert McCutcheon, Holstein, secretary.

East Central Iowa Veterinary Medical Society, the Second Thursday of each month at 6:30 p.m., usually in Cedar Rapids, Iowa. T. F. Bartley, P.O. Box 454, Cedar Rapids, secretary.

Fayette County Veterinary Medical Association, the third Thursday of each month at 6:30 p.m. in West Union, Iowa. H. J. Morgan, West Union, secretary.

Lakes Veterinary Association, the first Tuesday of each month, September through May, at 6:30 p.m., at the Gardson Hotel, Estherville, Iowa. Barry Barnes, P.O. Box 162, Milford, secretary.

North Central Iowa Veterinary Medical Association, the third Thursday of April, at the Warden Hotel, Fort Dodge, Iowa. H. Engelbrecht, P. O. Box 797, Fort Dodge, secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Wisneslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northwest Iowa Veterinary Medical Association, the second Tuesday of February, May, September, and December, at the Community Bldg., Sheldon. W. Ver Meer Hull, secretary.

Southeastern Iowa Veterinary Association, the first Tuesday of each month at Mt. Pleasant, Iowa. Warren Kilpatrick, Mediapolis, secretary.

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Castle's new No. 8 Light does all this and more. It's all new in optics and in style. The new multi-step reflector virtually eliminates shadow and glare. Its filter gives new balanced color, just like sunlight, for accurate perception. The styling is new, too—streamlined and beautiful with a choice of Green, Coral, or Silvertone.

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Southwestern Iowa Veterinary Medical Association, the first Tuesday of April and October, Hotel Chieftain, Council Bluffs, Iowa. J. P. Stream, 202 S. Stone St., Creston, secretary.

Upper Iowa Veterinary Medical Association, the third Tuesday of each month at 7:00 p.m., at All Vets Center, Clear Lake, Iowa. W. A. Danker, Dows, Iowa, secretary.

KENTUCKY—Central Kentucky Veterinary Medical Association, the first Wednesday of each month. R. H. Folsom, P.O. Box 323, Danville, Ky., secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday of each month in Louisville or within a radius of 50 miles, except January, May, and July. G. R. Comfort, 2102 Reynolds Lane, Louisville, Ky., secretary-treasurer.

MARYLAND—Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m., at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Leonard D. Krinsky, 6111 Hartford Rd., Baltimore, Md., secretary.

MICHIGAN—Central Michigan Veterinary Medical Association, the first Wednesday of every month at 7 p.m. Jerry Fries, 2070 E. Main St., Owosso, Mich., secretary.

Mid-State Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert W. Acton, 4110 Spring Rd., Jackson, Mich.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. Alvin R. Conquest, P.O. Box 514, Grand Blanc, Mich., secretary.

Southeastern Michigan Veterinary Medical Association, the fourth Wednesday of every month, September through May. Louis J. Rossoni, 24531 Princeton Ave., Dearborn 8, Mich., secretary.

MISSOURI—Greater St. Louis Veterinary Medical Association, the first Friday of each month (except July and August), at the Coronado Hotel, Lindell Blvd. and Spring Ave., St. Louis, Mo., at 8 p.m. Edwin E. Epstein, 4877 Natural Bridge Ave., St. Louis 15, Mo., secretary.

Kansas City Veterinary Medical Association and Kansas City Small Animal Hospital Association, the third Thursday of each month at the Hotel President, Kansas City, Mo. Robert E. Guilfoil, 18 N. 2nd St., Kansas City 18, Kan., secretary.

NEVADA—Western Nevada Veterinary Society, the first Tuesday of each month. Paul S. Silva, 1170 Airport Road, Reno, Nev., secretary.

NEW JERSEY—Central New Jersey Veterinary Medical Association, the second Thursday of November, January, March, and May at Old Hights Inn, Hightstown, N. J. David C. Tudor, R.D. 1, Box 284A, Cranbury, N. J., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April, except December, at the Irvington House, 925 Springfield Ave., Irvington, N.J. Bernard M. Weiner, 787 Clinton Ave., Newark, N.J., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Elks Club, Hackensack. James R. Tanzola, Upper Saddle River, N.J., secretary.

Northwest Jersey Veterinary Society, the third Wednesday of every odd month. G. L. Smith, P.O. Box 930, Trenton, N.J., secretary.

South New Jersey Veterinary Medical Association, the fourth Tuesday of each month at the Collmont Diner, Collingswood, N.J. Marvin Rothman, 718 Dwight Ave., Collingswood, N.J., secretary.

NEW MEXICO—Bernalillo County Veterinary Practitioners Association, third Wednesday of each month, Fez Club,

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vitamin-mineral dietary supplement—with taste appeal to small animals

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This new meat-flavored dietary supplement contains nineteen important ingredients in tablet form. Small animals like them!

The comprehensive Pet-Tabs formula:

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Bristol, Tennessee

Albuquerque, N.M. Jack Ambrose, 3018 N. Rio Grande Blvd., Albuquerque, secretary-treasurer.

NEW YORK—New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

Monroe County Veterinary Medical Association, the first Thursday of even-numbered months except August. Irwin Bircher, 50 University Ave., Rochester, N. Y., secretary.

NORTH CAROLINA—Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel, Greensboro. C. G. Sims, 2450 Battleground Ave., Greensboro, N. Car., secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month, time and place specified monthly. Byron H. Brow, Box 453, Goldsboro, N. Car., secretary.

Piedmont Veterinary Medical Association, the last Friday of each month. J. G. Martin, Boone, N. Car., secretary.

Twin Carolinas Veterinary Medical Association, the third Friday of each month at Orange Bowl Restaurant, Rockingham, N. Car., at 7:30 p.m. J. E. Currie, 690 N. Leak St., Southern Pines, N. Car., secretary.

Western North Carolina Veterinary Medical Association, the second Thursday of every month at 7:00 p.m. in the George Vanderbilt Hotel, Asheville, N. Car. Viiu Lind, 346 State St., Marion, N. Car., secretary.

OHIO—Cincinnati Veterinary Medical Association, the third Tuesday of every month at Shuller's Wigwam, 6210 Hamilton Ave., at North Bend Road. G. C. Lewis, 451 E. Galbraith Rd., Cincinnati, Ohio, secretary-treasurer.

Columbus Academy of Veterinary Medicine, every month, September through May. E. M. Simonson, 3120 Valley View Dr., Columbus, Ohio, secretary-treasurer.

Cuyahoga County Veterinary Medical Association, the first Wednesday in September, October, December, February, March, April and May, at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. F. A. Coy, 8208 Carnegie Ave., Cleveland, Ohio, secretary.

Dayton Veterinary Medical Association, the third Tuesday of every month. O. W. Fallang, 6941 Far Hills Ave., Dayton, secretary.

Killbuck Valley Veterinary Medical Association, the first Wednesday of alternate months beginning with February. C. Gale, Wooster, Ohio, secretary-treasurer.

Mahoning County Veterinary Medical Association, the Fourth Tuesday of each month, at 9:00 p.m., Youngstown Maennerchor Club, Youngstown, Ohio. Sam Segall, 2935 Glenwood Ave., Youngstown, secretary.

Miami Valley Veterinary Medical Association, the first Wednesday of December, March, June, and September. J. M. Westfall, Greenville, Ohio, secretary-treasurer.

North Central Ohio Veterinary Medical Association, the last Wednesday of each month except during the summer. R. W. McClung, Tiffin, Ohio, secretary-treasurer.

Northwestern Ohio Veterinary Medical Association, the last Wednesday of March and July. C. S. Alvanos, 1683 W. Bancroft St., Toledo, Ohio, secretary-treasurer.

Stark County Veterinary Medical Association, the second Tuesday of every month, at McBrides Emerald Lounge,

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LIQUAMAST*

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1. Maximum Antibiotic Levels in Milk
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broad antibacterial action . . . effective anti-inflammatory action.

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fast-acting, potent glucocorticoid/anti-inflammatory agent.

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Canton, Ohio. M. L. Willen, 4423 Tuscarawas St., Canton, Ohio, secretary.

Summit County Veterinary Medical Association, the last Tuesday of every month (except June, July, and August), at the Mayflower Hotel, Akron, Ohio. M. L. Scott, 42 W. Market St., Akron, Ohio, secretary-treasurer.

Tri-County Veterinary Medical Association, the fourth Wednesday of January, May, and September. Mrs. R. Slusher, Mason, Ohio, secretary-treasurer.

OKLAHOMA—Oklahoma County Veterinary Medical Association, the second Wednesday of every month, 7:30 p.m., Patrick's Foods Cafe, 1016 N.W. 23rd St., Oklahoma City. Claude A. Tigert, 3032 N.W. 68th St., Oklahoma City, Okla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Arlen D. Hill, 5302 E. 11th St., Tulsa, Okla., secretary.

Tulsa Association of Small Animal Veterinarians, first and third Mondays, City-County Health Dept. T. E. Messler, 3104 E. 51st St., Tulsa, Okla., secretary.

OREGON—Portland Veterinary Medical Association, the second Tuesday of each month, at 7:30 p.m. Ireland's Restaurant, Lloyds, 718 N.E. 12th Ave., Portland. Donald L. Moyer, 8415 S.E. McLoughlin Blvd., Portland 2, Ore., secretary.

Willamette Veterinary Medical Association, the third Tuesday of each month, except July and August, at the Marion Hotel, Salem. Robert J. Mallorie, P.O. Box 155, Silverton, Ore., secretary.

PENNSYLVANIA—Keystone Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania School of Veterinary Medicine. Raymond C. Snyder, N.E. Corner 47th St. and Hazel Ave., Philadelphia 43, Pa., secretary.

Lehigh Valley Veterinary Medical Association, the first Thursday of each month. Stewart Rockwell, 10th and Chestnut Sts., Emmaus, Pa., secretary.

Pennsylvania Northern Tier Veterinary Medical Association, the third Wednesday of each odd numbered month. R. L. Michel, Troy, Pa., secretary.

SOUTH CAROLINA—Piedmont Veterinary Medical Association, the third Wednesday of each month at the Fairforest Hotel, Union, S. Car. Worth Lanier, York, S. Car., secretary.

Georgia-Carolina Veterinary Medical Association—see GEORGIA.

TEXAS—Coastal Bend Veterinary Association, the second Wednesday of each month. Jack E. Habluetzel, Route 1, Box 65-N, Ingleside, Texas, secretary.

Dallas County Veterinary Medical Association, the first Tuesday of each month at 7:30 p.m., at a place to be specified. Frank N. Black, 12830 Preston Rd., Dallas, Texas, corresponding secretary.

VIRGINIA—Central Virginia Veterinary Association, the second Thursday of each month at 8:00 p. m., except July and August, at a place in Richmond to be announced monthly. Edwin M. Crawford, secretary-treasurer.

Northern Virginia Veterinary Conference Association, the second Tuesday of each month. T. P. Koudelka, P.O. Box 694, Harrisonburg, Va., secretary.

Northern Virginia Veterinary Society, the second Wednesday of every third month. Meeting place announced by letter. H. C. Newman, Box 145, Merrifield, secretary.

Southwestern Virginia Veterinary Medical Association, the first Thursday of each month. D. F. Watson, Blacksburg, secretary.

WASHINGTON—Seattle Veterinary Medical Association, the third Monday of each month, Magnolia American Legion Hall, 2870 32nd W., Seattle. Roy C. Toole, 10415 Main St., Bellevue, secretary.

South Puget Sound Veterinary Association, the second Thursday of each month except July and August. B. D. Benedictson, 3712 Plummer St., Olympia, Wash., secretary.

WEST VIRGINIA—Kyowva (Ky., Ohio, W. Va.) Veterinary Medical Association, the third Thursday of each month in the Hotel Pritchard, Huntington, W. Va., at 8:30 p.m. Harry J. Fallon, 200 5th St., W. Huntington, W. Va., secretary.

WISCONSIN—Central Wisconsin Veterinary Medical Association, the second Tuesday of each quarter (March, June, Sept., Dec.) C. R. Carlson, 1109 E. LaSalle Ave., Barron, Wis., secretary.

Coulee Region Veterinary Medical Association, the third Wednesday of every other month. F. N. Petersen, Box 127, Cashton, Wis., secretary.

Dane County Veterinary Medical Association, the second Thursday of each month. Dr. E. P. Pope, 409 Farley Ave., Madison, Wis., secretary.

Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. Dr. Jordan Lewis, Menomonee Falls, Wis., secretary-treasurer.

Northeastern Wisconsin Veterinary Medical Association, the third Wednesday in April. William Madson, 218 E. Washington St., Appleton, Wis., secretary.

Rock Valley Veterinary Medical Association, the first Wednesday of each month. L. C. Allenstein, 209 S. Taft St., Whitewater, Wis., secretary.

Southeastern Veterinary Medical Association, the third Thursday of each month. John R. Curtis, 419 Cook St., Portage, Wis., secretary.

Wisconsin Valley Veterinary Medical Association, the second Tuesday of every other month. John B. Fleming, 209 E. 4th St., Marshfield, Wis., secretary.

A Healthy Baby from a Rabies-Infected Mother

Seven days after a woman gave birth to a baby, in Russia, she developed rabies (confirmed) and died. The child did not develop rabies, indicating that the virus did not pass the placenta during the incubation period.—*J.Am.M.A. (Feb. 7, 1959): 762.*

Sometimes smallness is mighty big!

It's amazing how some of the 5'7" players on the basketball court can hold their own against the 6'8" giants. Some of them do it through sheer determination to get ahead. They must display exceptional performances to succeed against the seemingly overwhelming odds confronting them.

Your Independent Veterinary Supplier finds himself in the same precarious position, with the seemingly overwhelming odds presented in the form of competition by large corporations.

As an individual, he has infinite faith in American Free Enterprise and faith in his customers who appreciate the individual attention they receive through the services of an Independent Veterinary Supplier. The excellent service he offers, and your support, is the Independent Wholesaler's "sling and stone" against competitive giants.

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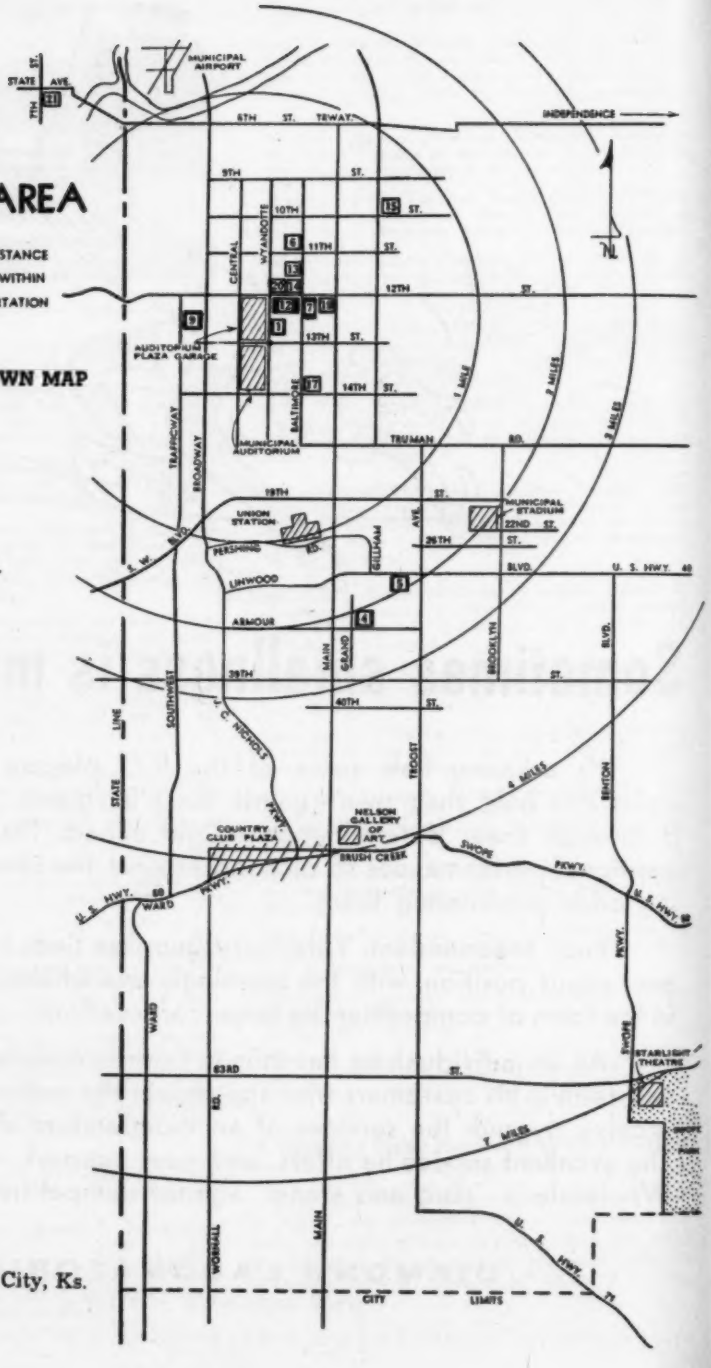
Map of the
GREATER KANSAS CITY AREA

ALL HOTELS NOT IN WALKING DISTANCE OF MUNICIPAL AUDITORIUM ARE WITHIN 10 MINUTES BY PUBLIC TRANSPORTATION

HOTEL LIST AND DOWNTOWN MAP

NO.	HOTEL
1	Aladdin, 1213 Wyandotte
4	Bellerive, 214 East Armour Blvd.
5	Berkshire, 1021 E. Linwood
6	Continental, 11th & Baltimore
7	Dixon, 12th & Baltimore
9	Kansas Citian, 1216 Broadway
12	Muehlebach, 12th & Baltimore
13	New Yorker, 1114 Baltimore
14	Phillips, 12th & Baltimore
15	Pickwick, 10th & McGee
17	President, 14th & Baltimore
19	Senator, 17 W. 12th St.
20	State, 12th & Wyandotte
21	Town House, 7th and State, Kansas City, Ks.



HOTEL INFORMATION — KANSAS CITY, MO., CONVENTION

Ninety-Sixth Annual AVMA Meeting, Aug. 23-27, 1959

All requests for hotel accommodations will be handled by a Housing Bureau in cooperation with the Committee on Local Arrangements. The Bureau will clear all requests and confirm reservations.

Hotel and Rate Schedule

Map No.	Hotel	Single	Double	Twin	Suite
1.	Aladdin*	$4.50-8.50	$ 6.50-10.50	$ 9.50-12.00	$17.00-30.00
4.	Bellerive*	5.00-9.00	8.00-12.00	9.00-13.00	From $18.00
5.	Berkshire*	5.00-7.00	7.00-10.00	8.50-10.00	From $14.00
6.	Continental*	6.50-11.00	8.50-13.50	10.00-14.00	$20.00-32.00
7.	Dixon	4.50-7.00	6.50-9.00	8.00-12.00	- - - - - - -
9.	Kansas Citian	3.50-8.00	5.50-11.00	7.00-14.00	From $10.00
12.	Muehlebach*	Headquarters Hotel — No Room Accommodations			
13.	New Yorker	5.50-12.00	8.00-14.00	9.50-14.00	$23.00
14.	Phillips*	7.50-10.50	9.50-13.00	11.50-14.00	$20.50-35.00
15.	Pickwick*	5.85-10.85	6.35-10.85	8.35-12.50	From $14.00
17.	President*	6.50-10.00	9.50-13.00	11.00-15.00	$25.00
19.	Senator	3.50-7.00	5.00-10.00	6.00-10.00	$15.00
20.	State	4.75-6.50	7.50-8.75	8.75-9.25	- - - - - - -
21.	Town House*	5.50-12.00	10.00-13.50	11.00-16.00	From $23.00

*100 per cent air-conditioned; in other hotels listed, majority of rooms air-conditioned.

FAMILY PLAN—The above hotels offer a "family plan" whereby children under 14 years of age will be accommodated in the same room with their parents at no extra charge. If more than one room is required to accommodate children, the hotel will charge only the single rate for each room.

MOTELS—Reservations for motels in the Kansas City area may be made through the Kansas City Convention and Visitors Bureau, 1030 Baltimore Ave., Third Floor, Kansas City 5, Missouri.

PLEASE USE APPLICATION ON REVERSE SIDE FOR HOTEL ACCOMMODATIONS

Application for Hotel Accommodations

1959 AVMA Convention — Kansas City, Missouri

The Convention and Visitors Bureau will make every effort to place you according to your expressed wishes, or to best advantage elsewhere if that is not possible and you desire us to do so.

Please give us the complete information requested below. At least four choices of hotels, or more if you desire, are necessary. Arrange for double occupancy of rooms wherever possible; only a limited number of single rooms is available.

Date.....

Please make hotel reservation in accordance with the following:
Accommodations desired:

Hotel.....First Choice

Hotel.....Second Choice

Hotel.....Third Choice

Hotel.....Fourth Choice

.....Room WITH bath for one person Rate per room desired $..... to $.....

.....Room WITH bath for two persons (double bed) Rate per room desired $..... to $.....

.....Room WITH bath for two persons (twin beds) Rate per room desired $..... to $.....

.....Large room WITH bath for..... persons Rate per room desired $..... to $.....

.....Suite—Parlor, ...Bedroom(s) with bath for ..... persons. Rate per suite desired $.....

Arrival date....., hour.....A. M. .....P. M.
Departure date.....

If reservation cannot be made in one of the hotels indicated shall we place you elsewhere? Yes..... No.....

Please check your mode of transportation: Car..... Train..... Plane..... Bus.....

Rooms will be occupied by (NAMES OF ALL PARTIES MUST BE LISTED)
(PLEASE PRINT)

NAME	STREET ADDRESS	CITY	STATE

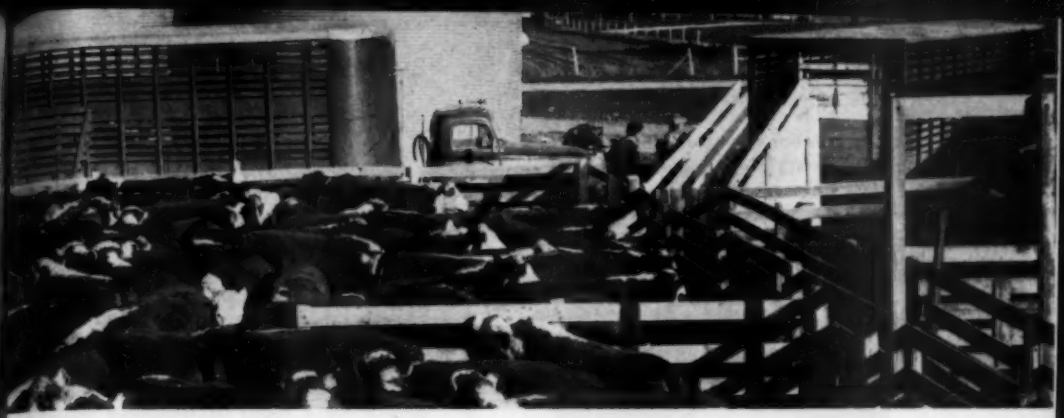
.....Check here if you desire accommodations on the FAMILY PLAN.

Name .....

Street address .....

City ..... State .....

Mail to: Convention and Visitors Bureau, 1030 Baltimore Ave., Kansas City 5, Mo.



Weight losses reduced when cattle are shipped*

Veterinarians and cattlemen have long sought to reduce weight losses suffered by cattle when shipped from range to feed lot. Weight losses caused by the rigors of handling, loading, and shipping cannot be reduced unless the tension, nervousness, and unruliness associated with these procedures are controlled.

INJECTION SPARINE given intramuscularly to cattle prior to shipment markedly reduces weight losses when cattle are shipped. SPARINE-treated cattle remain steady on their feet even in transit *without impairment of consciousness.*

In a study supervised by veterinarians, cattle were shipped from a range in Oklahoma to a Colorado feed lot—an 18-hour truck trip. The veterinarians observed that not only were weight losses reduced by over fifty per cent in most cases, but the animals given SPARINE, 0.5 mg. per pound of body weight, were easier to handle; they went back on feed faster because they adjusted to their new surroundings without milling, fence walking, and bawling.

In Small Animal Practice

SPARINE is useful also to reduce struggling during physical and x-ray examinations, and during dental procedures. When administration of a general anesthetic is undesirable, local anesthesia supported by SPARINE offers a satisfactory substitute. Given orally or parenterally, SPARINE calms animals during hospitalization and convalescence, reducing patient mutilation of bandages, sutures, etc. As adjunctive therapy, SPARINE reduces self-inflicted damage associated with otitis, eczema and pruritus.

SPARINE is safe. No untoward reactions or blood dyscrasias have been reported following use of SPARINE.

*From range to feed lot.

Injection Sparine®

HYDROCHLORIDE

Promazine Hydrochloride, Wyeth

AVAILABLE: INJECTION: 50 mg. per cc., vials of 10, 30 and 100 cc.
TABLETS: 25, 50, 100 mg., vials of 50.

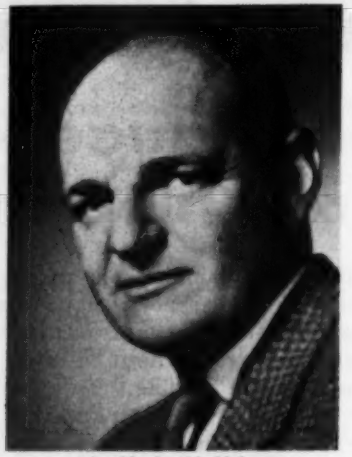
SUPPLIED ONLY TO VETERINARIANS

Comprehensive literature supplied upon request

Wyeth®
Philadelphia 1, Pa.

Wyeth International Names Charles H. Huber Veterinary Sales Manager

Charles H. Huber has been appointed sales manager of the veterinary division of Wyeth International Ltd. His experience in this special field includes sales positions both in the United States and abroad. He has resided and traveled extensively in South America, Central America, and England.



Mr. Charles H. Huber

His interest in the veterinary field stems from his education in agriculture, animal husbandry, and marketing at Cornell University. He still pursues his hobby of farming at his home in LaGrangeville, N.Y.

Mr. Huber is vice-president and director of the Cornell Alumni Association Graduate School of Business and Public Administration.

Dr. McMillan Joins Sterwin Chemicals, Inc. as Poultry Specialist

Dr. Thomas O. McMillan (TEX '45) has joined the staff of Sterwin Chemicals, Inc. in the capacity of poultry specialist.

He had previously been associated with the Animal Industry Section, Agricultural Division, of American Cyanamid Company since 1953.

Dr. Johnston Appointed Veterinary Medical Director at Pitman-Moore

Dr. R. Victor Johnston (TEX '48) has been named director of the Veterinary Medical Department of Pitman-Moore Company, Indianapolis, Ind.

Dr. Johnston joined Pitman-Moore Company in 1948 and was made manager of veterinary professional relations in 1956.

CLASSIFIED ADVERTISEMENTS

PERSONAL WANT ADS—$4.00 for the first 25 words and 10 cents for each additional word; 35 cents for use of box number.

TOTAL WORD COUNT must include complete box number address (7 words) or personal address line.

COMMERCIAL WANT ADS—$5.00 for the first 25 words, 25 cents for each additional word; $1.00 for use of box number. (See paragraph above for total word count.)

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DEADLINES

1st of month issue — 6th of month preceding date of issue.

15th of month issue — 20th of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the box number, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be sent to the advertiser.

Wanted—Veterinarians

Wanted—middle-aged veterinarian, full or part time, to assist two veterinarians in small animal practice in Tucson. State qualifications and salary desired. Address Box H 5, JOURNAL of the AVMA.

Veterinarian wanted—active managership, veterinary hospital near Chicago, on partnership basis. No capital. Address Box H 35, JOURNAL of the AVMA.

THE NEW ZEALAND MEDICAL RESEARCH COUNCIL

HYDATID RESEARCH UNIT

Applications are invited for the post of IMMUNOLOGIST with the Hydatid Research Unit at North Taieri, near Dunedin, New Zealand.

This post is available for a three year period working on immunological aspects of hydatid disease. Previous experience with this disease would be an advantage but other research experience based on a sound knowledge of immunology and pathology would be adequate.

The salary offered for this position is £N.Z. 1800 per annum.

Applications close on *30 June 1959*.

Further particulars may be obtained from the Secretary, Association of Universities of the British Commonwealth, 36 Gordon Square, London, W.C.1. or from the undersigned, C/- University of Otago Medical School, P.O. Box 913, Dunedin, NEW ZEALAND.

C. A. MONROE
Administrative Officer.

Veterinary supervisor—chief meat inspector. Salary range is $6,447 to $7,836 per year. Supervise modern municipal meat control program. Doctor of Veterinary Medicine degree required. Prefer man with supervisory experience in meat inspection work. Excellent working conditions and personnel benefits. Civil Service status. Apply to Department of Personnel, City of St. Louis, 235 Municipal Courts Building, St. Louis 3, Mo.

Wanted—veterinarian with California license to assist in mixed practice. Permanent position with good salary and excellent working conditions. Address Dr. F. H. Saunders, 336 E. Lafayette St., Stockton 3, Calif.

To operate small animal hospital, salary and percentage, rent or lease, option to buy, Arizona license. Dr. M. J. Bramley, 560 S. Scottsdale Rd., Scottsdale, Ariz.

Excellent opportunity with Nevada State Department of Agriculture for graduate veterinarian with minimum of two years postgraduate experience in general laboratory diagnosis. Civil service position, salary range: $589-$713. Location, Reno. Duties: laboratory diagnosis, field investigation of animal diseases, and related work. Promotional future for qualified man. Division of Animal Industry, P.O. Box 1209, Reno, Nev.

Wanted—veterinarian as assistant in busy small animal practice in Chicago; 1959 or recent graduate desired. Excellent opportunity for clinical and management experience. Address Box H 28, JOURNAL of the AVMA.

Veterinarian—willing, capable veterinarian to assist in extensive general practice in Missouri. County Brucellosis regulatory field work is available. State availability, experience, and key information. Must be draft-exempt, neat, nonalcoholic and a credit to community. Salary $400 per month plus $1,000 bonus for first year. Can lead to profit-sharing basis. Will pay one-half of travel expenses for a personal interview. Address Box H 34, JOURNAL of the AVMA.

Wanted—student for summer employment, pet hospital, New York City. Excellent opportunity for experience; regular hours and salary. Address Box H 37, JOURNAL of the AVMA.

Wanted—veterinarian with some experience in large animal practice, September 1. Minnesota license required. Full partnership will be open. Please state age, and reference. Address Box H 42, JOURNAL of the AVMA.

Assistant in North Carolina veterinary hospital. Small animal practice 90 per cent, large animal practice 10 per cent; 100-cage hospital. Opportunity for a partnership for the right man. Address Box H 43, JOURNAL of the AVMA.

Wanted—veterinarian, Illinois license, for Chicago small animal hospital. Good opportunity. Immediately. Address Box H 45, JOURNAL of the AVMA.

Associate veterinarian for small animal hospital in Chicago suburbs. References required. Address Box H 49, JOURNAL of the AVMA.

To insure prompt delivery replies should be carefully addressed.

Wanted—assistant veterinarian for mixed practice in Arizona. Will consider June graduate. Address Box H 47, JOURNAL of the AVMA.

Wanted—Positions

Relief veterinarian available, New York and New Jersey licenses, small animals only. Address D.V.M., 1007 80th St., North Bergen, N.J.

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Graduate veterinarian, now in special graduate studies in public health, capable executive and personnel administration, desires challenging position in teaching; laboratory diagnostics; commercial sales, promotion, development; human or animal health program. Address Box H 38, JOURNAL of the AVMA.

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Practitioner, five years experience with own practice, desires to purchase small animal practice in Midwest, South, or East. Substantial down payment. Give full particulars. Address Box H 16, JOURNAL of the AVMA.

Wanted to buy—small animal or mixed practice in Virginia by experienced veterinarian. Available immediately for any fast deal. Address Box H 29, JOURNAL of the AVMA.

Wanted to purchase—small animal or mixed practice in northern Illinois by financially responsible veterinarian. Address Box H 30, JOURNAL of the AVMA.

Wanted—to buy, or a partnership, in small animal practice in California. Have six years experience in Iowa in mixed practice. Graduate of Kansas State College. Address Box H 39, JOURNAL of the AVMA.

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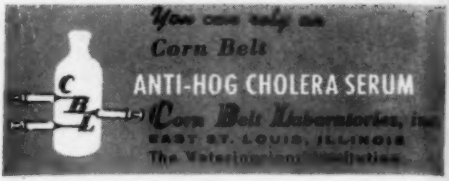

Index to Advertisers in This Issue

Affiliated Laboratories Corporation	13
Armour Veterinary Laboratories	9, 23, 30, 31
Associated Veterinary Laboratories	20, 21
Castle	38
Chicago Pharmacal Co.	8
Ciba Pharmaceutical Products, Inc.	15, 33
Colwell Publishing Co.	42
Commonwealth Agricultural Bureaux	50
Corn Belt Laboratories, Inc.	50
Corn States Laboratories, Inc.	2nd cover
Diamond Laboratories	43
East River Wire Works	36
Eaton Laboratories	11, 22, 35
Fort Dodge Laboratories	24
Gaines Dog Food	7
G.L.F.	14
Hill Packing Company	37
Hotel Reservations	44-46
Jensen-Salsbery Laboratories, Inc.	4th cover
MacAllan Laboratories	28
McCabe-Powers Body Co.	5
Massengill Company, S.E.	39
National Laboratories Corporation	19
Norden Laboratories	1
Ohio Chemical & Surgical Equipment Co.	6
Parke, Davis & Company	25
Pet Chemicals, Inc.	32
Pfizer Laboratories	6, 29, 40
Pitman-Moore Company	3, 3rd cover
Research Laboratories, Inc.	16
Silent Glow Oil Burner Corp.	18
Swift and Co.	17
Upjohn and Company	41
Westwood Pharmaceuticals	10
Wyeth	47

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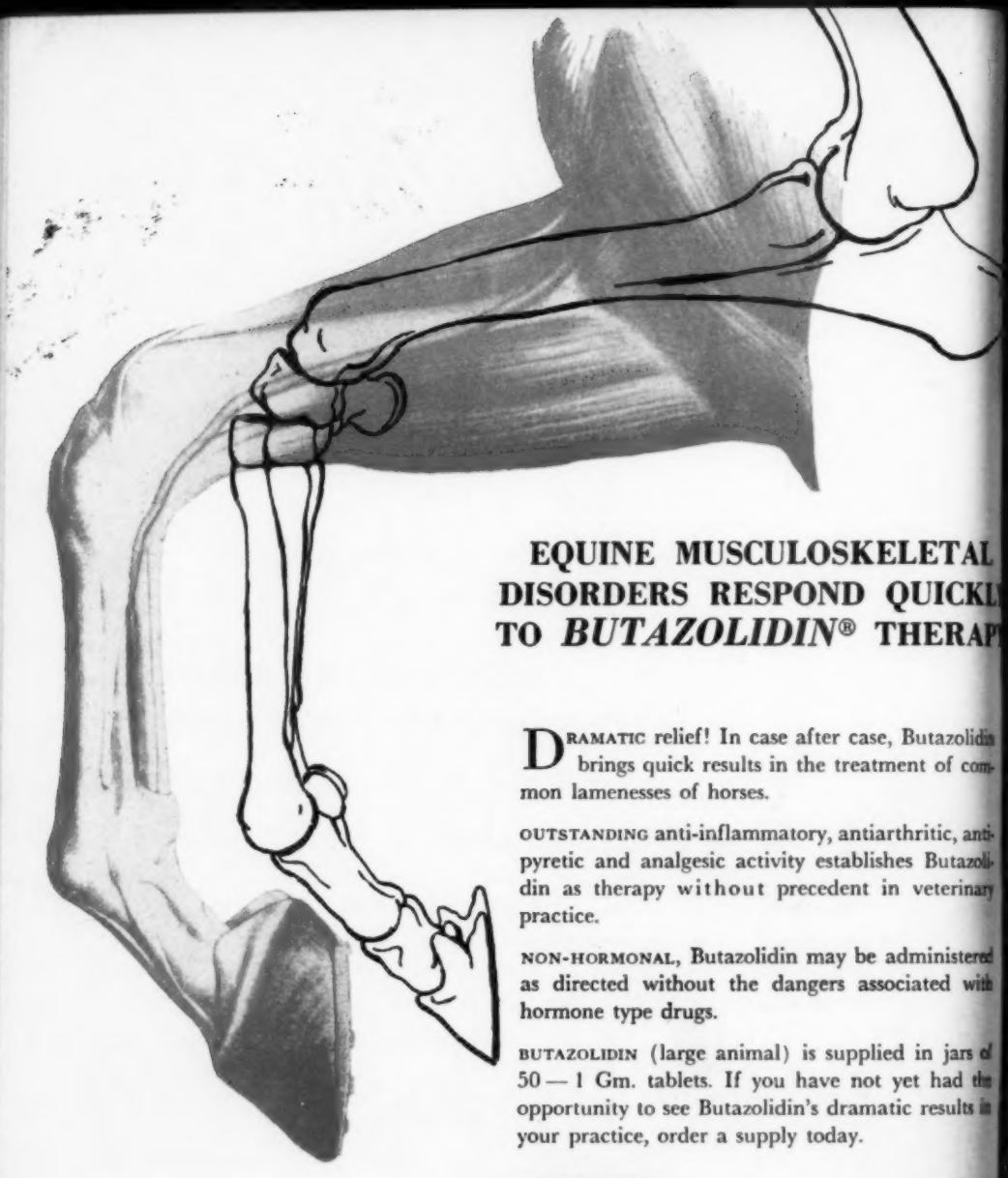

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